

THE IRON AGE

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Production Planning and Tracing System

Work for Moreland Motor Truck Plant
Planned on Production Chart and Closely
Followed by Means of Operation Tracer Cards

A PRODUCTION planning and routing system that has proved itself under actual working conditions and facilitates the handling of the many production details that crop up all the way from the engineering to the shipping department has been installed in the Moreland Motor Truck Co.'s plant at Los Angeles, Cal. Not only is a perpetual stock record maintained, declares H. M. Fitz, who has developed it, but many jobs that can scarcely be classed as production jobs, which, however, may later become such, are also well taken care of by means of this system. The records list all materials on order in the rough and in process, finished and assembled units.

The production sheet illustrated herewith shows the planned production of parts to build the scheduled number of units promised (these may be trucks of from 1 to 5 tons rating, passenger busses, passenger cars or motor street sweepers). Printed on this sheet as shown are the part numbers of trucks scheduled, amount of finished parts in stockroom, number of parts per truck (listed under class), total number of parts required, on order and left over, and under the days of the month at the top and to the right the number of assembled units planned for each day. Produc-

tion lines are drawn opposite each part number as shown and indicate how many trucks can be built with the parts scheduled and at what date the materials must be finished in the machine shop to keep up the assembly process.

Close tab is kept on every job by means of the operation tracer card, illustrated herewith, on which is printed all information pertaining to the job as shown. The card is made in different colors for different departments and classes of work. Blue, for instance, is used for standard production, red for repair and mail-order work, and yellow for "sent-ahead" jobs. All work is ordered into process by the planning department as "Regular Production," "Repair" or "Special Work." No material can be issued from the stockroom without the tracer card, since the card is, in fact, the order to commence work.

Two detachable receipts are provided as shown, one being filled out and signed by the stock clerk when the card is sent to the stockroom as a requisition for material, and the other by the foreman on receipt of the material, who then sends it on to the planning department. The operation card minus the detachable receipt is next assigned by the foreman to one of the workmen under him who

| PART NO. | CLASS | QUANTITY | DATE |
|----------|-------|----------|------|
| 1 | 2 | 3 | 4 |
| 5 | 6 | 7 | 8 |
| 9 | 10 | 11 | 12 |
| 13 | 14 | 15 | 16 |
| 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 |
| 25 | 26 | 27 | 28 |
| 29 | 30 | 31 | 32 |
| 33 | 34 | 35 | 36 |
| 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 |
| 45 | 46 | 47 | 48 |
| 49 | 50 | 51 | 52 |
| 53 | 54 | 55 | 56 |
| 57 | 58 | 59 | 60 |
| 61 | 62 | 63 | 64 |
| 65 | 66 | 67 | 68 |
| 69 | 70 | 71 | 72 |
| 73 | 74 | 75 | 76 |
| 77 | 78 | 79 | 80 |
| 81 | 82 | 83 | 84 |
| 85 | 86 | 87 | 88 |
| 89 | 90 | 91 | 92 |
| 93 | 94 | 95 | 96 |
| 97 | 98 | 99 | 100 |

Information Pertaining to a Job Is Printed on This Operation Tracer Card, Which Follows the Job Until Completed. When each operation is finished and approved the card is punched in the O.K. column

| OPERATION TRACER | | | | | | | | | |
|---|----------|------------------------|--|-------------------------|----------|----------|----------|----------|----------|
| S. O. 12202 | | Amt. 50 | | Dwg. No. J-61 | | | | | |
| Part Name | | 4 ton Gasifier | | No. 173-400 | | | | | |
| Mat. Req. | | C. I. | | | | | | | |
| Used on | | 4 and 5 ton trucks | | | | | | | |
| Mat. Fur. | | C. I. | | | | | | | |
| Date 6/6/20 | | Issued 20 | | Wanted Fin. Date 6/9/20 | | | | | |
| Rec'd 15 | | Dept. S-2 | | Signed R. Q. Runn | | | | | |
| Op. | Seq. No. | OPERATION | | Seq. No. | Est. No. | St. Pts. | St. Pts. | St. Pts. | St. Pts. |
| Q | 1 | Grind Long Side | | G-3 | 496 | 20 | | | 67- |
| Q | 2 | Grind Carburetor Side | | G-3 | 320 | 18 | | | 67- |
| Q | 3 | Grind Exhaust Side | | G-3 | 798 | 18 | | | 67- |
| R | 4 | Drill 1" Stud Holes | | UP | 340 | 18 | | | 67- |
| R | 5 | Drill & Spot Core Side | | DP | 535 | 17 | | | 67- |
| H | 6 | Tap | | T- | 400 | 17 | | | 67- |
| T | 7 | Test | | T-5 | 690 | 15 | | | 67- |
| RECEIPT FOR MATERIAL | | | | | | | | | |
| S. O. 12202 | | Amt. 50 | | Dwg. No. J-61 | | | | | |
| Part Name | | 4 ton Gasifier | | No. 173-400 | | | | | |
| Mat. Req. | | C. I. | | | | | | | |
| Used on | | 4 & 5 ton trucks | | | | | | | |
| Mat. Fur. | | C. I. | | | | | | | |
| Date 6/6/20 | | Signed | | | | | | | |
| This card to be DETACHED, FILLED OUT, SIGNED BY FOREMAN and RETURNED TO PLANNING DEPARTMENT | | | | | | | | | |
| TRACER REQUISITION | | | | | | | | | |
| S. O. 12202 | | Amt. 50 | | Dwg. No. J-61 | | | | | |
| Part Name | | 4 ton Gasifier | | No. 173-400 | | | | | |
| Mat. Req. | | C. I. | | | | | | | |
| Used on | | 4 & 5 ton trucks | | | | | | | |
| Mat. Fur. | | C. I. | | | | | | | |
| Date 6/6/20 | | Signed | | | | | | | |
| This card to be DETACHED, FILLED OUT, SIGNED and RETAINED BY STOCK CLERK. | | | | | | | | | |

This Production Chart Gives at a Quick Glance the Planned Production of Parts to Build the Scheduled Number of Automotive Units Promised

is provided with a special rack in which the card is filed and which is placed in plain view conveniently near the machine with the workman's machine number marked on it.

The rack has three compartments and the placement of the card in one of these compartments indicates whether the job is in the hands of the workman, is soon to be undertaken or is finished. Compartment No. 1 contains all tracer cards for jobs which are designated for the workman, but on which he has not commenced work. The foreman arranges the cards in this compartment in the order the completion of the jobs is desired by the planning department. The workman then knows how and what to prepare for in the way of securing drawings, tools, jigs and fixtures before it is time to work on the job. Compartment No. 2 is for the card covering the job in hand, while compartment No. 3 contains the card for the job just completed.

When approved and punched by the inspector and information on it recorded by the timekeeper the card with material is ready for removal to the next machine as designated opposite operation following. At this next machine, of

course, the card is placed in No. 1 compartment until the workman is ready to work on the job.

A special effort is made at all times by prompt inspections and time keeping to keep the container No. 3 empty and the work moving to the next machine, or, if it is finished, to deliver the various parts with tracer card to the storeroom. In the storeroom, receipt is made out for good pieces delivered and the tracer card passed on to the stock clerk for entry on the stock records. The card then goes to the planning department to be recorded and finally to the cost department, where information on it is checked with time tickets.

The fact that the workman has moved a card from container No. 2 to No. 3 and from No. 1 to No. 2 indicates, of course, that the workman has finished a job and is starting on a new one. The timekeeper keeps close watch of every rack and as soon as a man has moved a card, he makes note of it on the man's time ticket, transferring all necessary information, including the time the job was started and finished, whether standard time or contract price is to be allowed, and also the number of good pieces and those with foundry defects as designated by the inspector.

| REASONS FOR SCRAPPAGE OR SENT AHEAD | |
|---|-----------------------------------|
| MUST BE STATED OPPOSITE OPERATION NO. ON WHICH SCRAPPAGE TOOK PLACE | |
| Op. No. | No. of Pieces |
| 2 | Ground 1/2 short. Salvage. 2. |
| 3 | Drilled wrong not in jig sight. 1 |
| 7 | Drumy back. Scrap. Salvage. 2 |
| 5 | |
| DATE 6-20-20 REMARKS—NOTICE | |
| Need more grinder work. | |
| C. Jackson | |
| DATE 6-20-20 REMARKS—NOTICE | |
| Only 14 Castings in stock. | |
| R. A. Pasher. | |
| STOCK DEPT. | |

This Form Is Printed on the Back Side of the Tracer Card. The inspector writes on this the reasons for scrapping a piece of work or sending it ahead before it is completed

Combination Operation Tracer Card, Time Ticket and Blueprint Holder. The tracer cards are placed in compartments No. 1, No. 2 or No. 3, according to whether the job is about to be worked upon, is being worked upon or is finished.

The inspector examines the work after the completion of each operation of each job and when O. K. punches the tracer card in the O. K. column, as shown in the illustration. If any parts are found defective, he notes this on a form which is printed on the back of the tracer card with heading, "Reasons for Scrappage or Sent Ahead," as shown in the illustration. He writes why the work is not approved, and the number of pieces defective and places inspector's defective tag on parts with such information as shop order number, part number, number of pieces defective and why, whether to be scrapped or not and if to be salvaged, how. Defective parts always go to the salvage department, where the final decision is made as to whether parts are to be scrapped or not.

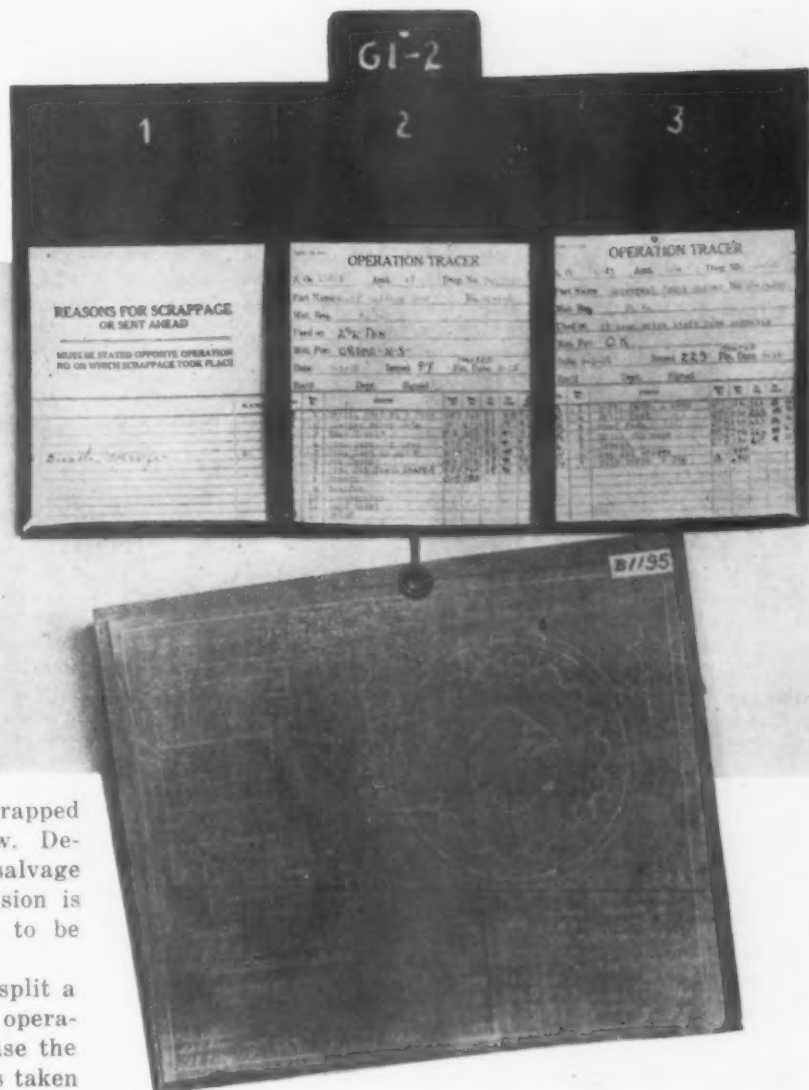
Sometimes it is necessary to split a job or send it ahead before all operations are completed. In such case the inspector must examine the parts taken away and make note thereof of the back of the tracer card. Authority for splitting a job or sending pieces ahead comes from the planning department and for the purpose a "sent ahead" card is provided.

The tracer system described above is very useful in giving a comprehensive idea of status of material in process. This is especially so when taking an inventory. Stock records in such case for instance, show how much material is in rough stock, in process, and also how much is finished, but the tracer cards show the status of work in process and from these the money spent on labor can be estimated.

Fire last week damaged the Woburn Iron Foundry plant, Woburn, Mass., to the extent of \$12,000. The fire started in the moulding room and spread to the entire main building. The Palmer Foundry Co., Palmer, Mass., which is temporarily housed under a shed, the plant having burned several months ago, is increasing its production and recently took on enough business to keep it operating at capacity the balance of the year.

The Pacific Coast Steel Co., Seattle, plans a number of important improvements to its plant, including the erection of an addition to the open-hearth department and construction of a 16 x 14 mill. New machinery will be installed. Improvements will involve an expenditure of \$100,000.

Improvements estimated to cost \$100,000 are to be made at the Sligo Iron & Steel Co.'s plant in Connellsville, Pa. The output of the plant is to be increased from 6000 tons a month to 7500 tons.



Effect of Machining Malleable Cast Iron

In a paper before the recent twenty-third annual meeting of the American Society for Testing Materials at Asbury Park, N. J., on "Effect of Machining and of Cross-Section on the Tensile Properties of Malleable Cast Iron," H. A. Schwartz supplied data as to the variations in the tensile properties of malleable cast iron with increase in cross-section, and also as to the effect of removal of the surface metal upon the tensile properties.

These data were graphically expressed by the author. Equations of the curves showing the relation between the tensile strength and percentage of elongation and the diameter of rough and machined specimens were also given.

As a result of the tests performed the author drew the following conclusions: (1) Decarbonization has a favorable influence upon the strength and ductility of the product; (2) the effect of quick cooling in freezing on the surface metal of a casting is such as to improve the strength and ductility of the product; (3) roughness of surface of a cast specimen apparently decreases the strength and especially the ductility; (4) the ultimate strength decreases with increasing diameter of section by an amount proportional to the cube of the diameter; (5) the elongation decreases by an amount proportional to the $2\frac{1}{2}$ power of the diameter; (6) the combined effect of all three of the preceding variables on strength amounts to about 7000 lb. per sq. in. for sections $\frac{1}{4}$ in. in diameter or less, and becomes negligible at diameters of $1\frac{1}{4}$ in. or over; (7) the combined effect on elongation is about 3 per cent for small specimens and negligible for diameters above $\frac{1}{4}$ in.; (8) the yield point is apparently not affected by any of the variables investigated.

FORD PLANT SAFETY REPORT

Continual Educational Campaign Results in Notable Reduction in Accident Toll

Only one fatality among nearly 60,000 workmen at its Highland Park Plant in 1919 and 80 per cent reduction of lost-time accidents for the past three years (based on a comparison of the accidents recorded in October, 1916, with those occurring in May, 1919) is the record in accident-prevention work to which the safety and factory hygiene department of the Ford Motor Co. points with some pride in a report recently issued by Robert A. Shaw, director of safety. To carry on this safety work the department employed four general inspectors, five special inspectors, one stenographer, two educational men, one bacteriologist, and one hygienic man, with seven men to clean drinking fountains twice daily and spray disinfectants throughout the plant. Approximately 2700 orders and communications were issued and completed to prevent accidents during the past year.

A continual educational campaign has been carried on by two educational men. Bulletin boards, safety slogans on the back of all clock cards, safety moving pictures, talks by foremen, etc., were some of the devices utilized to push the safety educational campaign. As the result, for instance, of talks by 107 foremen on the specific hazards encountered in their particular work, 27 per cent reduction in accidents was directly noticed.

The idea of lining up men at the street cars developed by the Ford people and known as the Ford idea, it

is pointed out, is growing throughout the country. Agitation for this method of boarding cars has been found advantageous in preventing fights, broken arms, etc.

A special inspector is employed for watching the punch presses, which every one will admit provide the greatest finger hazards in modern industry; but with the complete guarding and installation of various types of safety devices originating in the press department, such as the two-hand and push-button tripping devices, a great reduction in accidents on punch presses has been noted and it is declared that the machines are now practically as safe as other machines in the plant.

A special inspector for use on cranes and elevators, and another special inspector for grinders, suction and exhaust systems, welders, enamel bake ovens and stacks have assisted greatly in reducing accidents among men who work on these equipments and have also helped very much in improving the working conditions among these men. Lost time grinder accidents, for example, were practically eliminated and in five particular cases, eyes were known to have been saved by the wearing of goggles. Moreover, in the piston and piston ring departments the suction systems have removed the cause of requests for transfers from 22 per cent to 3 per cent.

In the report it is also pointed out that 75 per cent of the accidents were eliminated during the last six months at the Ford ship plant. At the Ford blast furnace plant, elaborate plans are also being developed for safety propaganda work. It is hoped to make these two auxiliary Ford plants as efficient, so far as safety work goes, as the huge automobile plant at Highland Park.

Norton Co. Buys French Plant

The Norton Co., Worcester, Mass., has purchased a large controlling interest in the Compagnie des Meules Norton, which operates a large modern plant at La Corneuve, a suburb of Paris, manufacturing grinding wheels of aluminous abrasives.

The Norton Co. takes full charge of the management and operation of the plant and of the distribution of the product. The works will be under the supervision of William La Costa Neilson, vice-president and foreign sales manager of the Norton Co., whose headquarters are in London.

Thomas S. Green, recently of the Worcester sales organization, will be resident manager.

The business was established two years ago as the Compagnie General des Meules, by French interests, consisting largely of men active in the metal industries of their country. They erected the plant, which has six 15-foot kilns, and an expanding capacity of 12 kilns. It will employ between 100 and 150 men and will manufacture Norton wheels for the French trade.

The Norton Co. was approached by the French owners some months ago because of their desire to ally themselves with a company having long experience in the manufacture of high grade wheels and abrasives. The result was the purchase of a majority of stock by the Worcester company, which will have a majority of the board of directors. The name was changed to the Compagnie des Meules Norton.

The Norton Co. already has plants in Canada, Japan and Germany. Just before the war the company acquired a tract of land in Leicester, England, and was planning to establish works on the premises. The war compelled the abandonment of the project for the time being. There is no intention of going ahead to the fulfillment of that plan in the near future.

Fatigue Properties of Aluminum

In a paper entitled "Fatigue and Impact Fatigue Tests of Aluminum Alloys," read before the American Society for Testing Materials at its twenty-third annual meeting recently held at Asbury Park, N. J., W. A. Gibson described an investigation to determine the fatigue properties of cast, forged and heat-treated

aluminum alloys, and to relate these properties to the corresponding properties of steel alloys used in places where it is thought aluminum might advantageously be used.

Results of a series of tests were given upon two types of cast alloys in fatigue and in impact fatigue. Results of three series of tests in fatigue were also given upon forged duralumin, with and without heat treatment. One series of tests was given upon a heat-treated carbon steel. In impact fatigue, a series of tests were given upon various duralumins and upon a very mild steel, a heat-treated carbon steel such as is commonly used in forgings, and upon a nickel steel.

In comparing the fatigue-resisting properties of forged duralumin with those of the common grades of steel forgings, the conclusion is drawn that for sections of equal size the aluminum alloys are equal to, if not superior to, forged steel.

Larger Supplies of Manganese

The scarcity of manganese which seemed to be threatening the United States earlier in the year is not probable now. The output of ferromanganese has been steadily mounting each month until in June it reached 26,265 tons, according to the blast furnace reports of THE IRON AGE, which include an estimate of the electric furnace output. The average for the second quarter is 5300 tons per month larger than that for the first quarter, or 23,318 tons against 18,049 tons per month. At the present rate of 20,684 tons per month for the first half, the year's output will exceed 248,000 tons. The imports are also growing, those for May having been nearly 4000 tons, the heaviest in the last seven months and exceeded only three times in 1919. Ore imports are also increasing, having been twice as large in April and May as in the first quarter, or 91,674 tons for the two months, against 44,539 tons for the three. Thus the rate to June has been over 27,000 tons per month or very nearly equal to the 1919 movement.

If the domestic production of ferromanganese continues at the present rate and the imports equal the average thus far maintained, the steel industry's needs for 1920, assuming a production of 44,000,000 tons of ingots and castings for the year, will easily be met.

THE FIRST CASTING MADE
IN AMERICA.
SAUCUS IRON WORKS,
1642
PRESENTED TO THE CITY OF LYNN
BY
JOHN E. HUDSON,
A DESCENDANT OF
THOMAS HUDSON,
THE OWNER OF THE SITE OF THE
IRON WORKS, TO WHOM THE FIRST
CASTING WAS GIVEN.
THIS CASE PRESENTED BY
CITIZENS OF LYNN.
1892.

THE first attempt at iron making in this country was made by the Virginia Co. of London, Eng. It set up in the Vir-

Again, in May, 1645, the court publicly declared the Saugus Works successful, presumably with a view to stimulating public interest in and support of the enterprise, although that is a presumption. The court, however, at this time did proclaim, in the same breath with the announcement of success, that £1,500 was needed to finish the forge and that between £1,200 and £1,500 had been expended by the company up to this time.

Cash Is Lacking

Not long afterward, Mr. Winthrop, Jr., removed to Connecticut to engage in the iron making business. From that time on the affairs of the Saugus Iron Works appear to have grown more and more complex, due primarily to the lack of cash, the diminishing supply of ore and lawsuits.

To New England belongs the industrial honor of the first successful iron making. The word "successful" in this case, however, applies to the practice and not the financial results. But it was from this pioneer New England business that grew our iron and steel industry, which to-day leads the world.

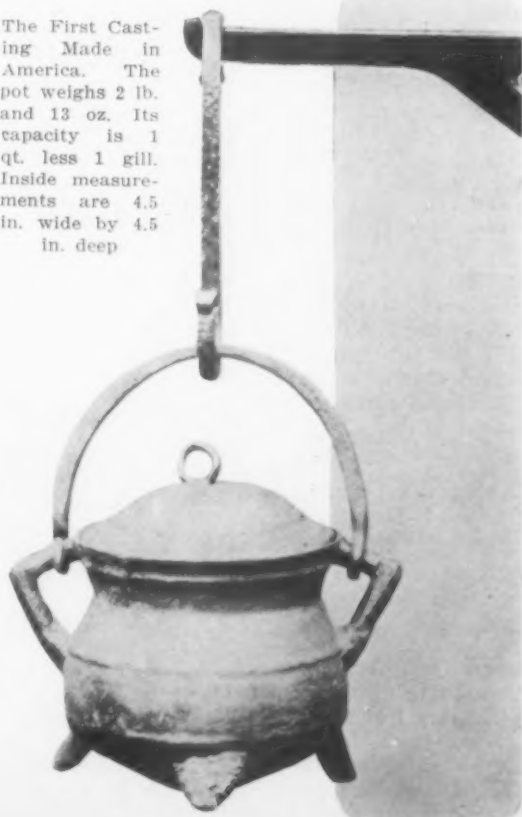
Many early settlers of Massachusetts crossed the broad Atlantic for religious freedom, but they, as well as others who settled elsewhere in this country, were impressed with reports of the metals to be found in the New World. Plymouth, Mass., it will be remembered, was settled in 1620. Lynn, Mass., or Saugus as it was then called, was settled in 1629, and very shortly afterward iron ore was discovered in the flat meadows on the upper parts of the Saugus River. Thomas Dexter is generally credited with the discovery, although authorities disagree on this point.

Certain it is, however, that this Thomas Dexter succeeded in interesting his fellow townsman, Capt. Robert Bridges, in the possibilities of the ore, for Captain Bridges went to England with samples of it and there formed the Company of Undertakers for the Iron Works, which consisted of 11 merchants and gentlemen, and a total paid in capital of £1,000, its purpose being to establish iron works at Saugus. John Winthrop, Jr., son of Governor Winthrop, Massachusetts Colony, was instrumental in forming the company and was a member of it. The company secured the services of Joseph Jenks as master mechanic, a man to whom our foundry industry owes much, yet whose praises have gone unsung for nearly 300 years. Richard Leader was agent for the undertakers.

Almost from the beginning of its activities the company enjoyed concessions, which in these modern times of Federal regulations and taxation read like fiction. Work on the Saugus Iron Works was begun probably in 1642. In November, the following year, the company was granted 3000 acres of common land at Braintree to encourage the erection of iron works there on the river Monotcut or Monontcut. But the purchase of land, water rights and materials in Saugus and the cost of labor undoubtedly soon exhausted the undertakers' original £1,000, or very nearly so, for in November, 1644, the Massachusetts General Court allowed three years for the perfection of the company's works, namely the finery and forge, the blast furnace "with that which belongeth to it" having been completed, or very nearly so, by that time.

The court also granted citizens the right to subscribe to stock in the enterprise in lots of £100. Persons unable to pay a full £100 were allowed to pool their money in £100 lots, with the stipulation that such sum

The First Casting Made in America. The pot weighs 2 lb. and 13 oz. Its capacity is 1 qt. less 1 gill. Inside measurements are 4.5 in. wide by 4.5 in. deep.





Site of the Saugus Iron Works. In the foreground, across the river, extending almost up to the roadway, can be seen piles of slag and cinders, which came from the furnace and forge. In the background can be seen the house of the agent, Richard Leader. The land sloped downward from the agent's house to the river. The built-up road is modern.

The lack of cash was for no lack of business, there being an excellent demand for the company's products. But payment for products more often was made in grain, wood, and other commodities than in specie, which made it necessary to try constantly to raise funds by the sale of shares in the company. And that desire of the American people to sue the corporation appears to have originated with the Saugus Iron Works.

There were frequent lawsuits in and previous to 1651, arising from the overflow of water. Then, too, fear that the works would cause a scarcity of timber also appears to have added to its unpopularity. As one authority stated in 1677, "the company was very much promoted and strenuously carried on for some time, but at length, instead of drawing out bars of iron for the country's use, there was hammered out nothing but contentions and lawsuits."

Site Well Selected

The works, however, was in active operation about 46 years. It was built on 60 acres on the westerly bank of the Saugus River, formerly owned by Thomas Hudson, who is believed to have been a relative of the Hudson for whom Hudson River was named. The site was well selected, situated as it was at the head of navigation, by a ford in the Boston-Salem highway. From various authorities it is certain the iron works was near bog ore deposits, yet the exact location of these deposits never was revealed in writing or by evidence of development. These bog ore deposits probably lay a few inches below the surface soil. The top or surface soil may have been loosened by plow and then removed by shovel, the ore, brown in color, thereby being easily accessible. As the years passed, the top soil which was not removed from the immediate vicinity of the ore deposits returned to its approximate original location by the action of the river waters, and trace of the ore deposits, therefore, was lost. It is reasonably certain, however, that the ore deposit was somewhere in Adam Hawkes' meadow.

Diligent search in records by the author and by other interested persons fails to uncover any detailed description of the works and the exact methods employed therein. Legislation and litigation records furnish numerous clues and these, coupled with common foundry practice in England at that time, provide a reasonable basis for deduction.

The Saugus Works, it is certain, then comprised a blast furnace, a bloomery or forge, and what in these modern days would be termed a machine shop.

Water Put to Work

Charcoal was the common fuel used in those days, coke then being unknown, and by it the bog ore was reduced in the blast furnace. In New England to-day, at least two irons, Salisbury and Richmond, are produced by charcoal fuel. The Saugus Works used oyster shells for fluxing, a practice which has by no means become extinct by use of prepared fluxes. Molten iron

was run direct from the blast furnace into V-shaped sand trenches, which produced long triangular bars called "sowes."

Earlier furnace practice in iron making in England necessitated hand and foot operation of bellows for blast purposes. This practice was supplemented by water power operation of bellows and it was by water power that this New England works operated.

To provide water power, a dam, about three-eighths of a mile from the furnace, 20 ft. wide at the base and 8 ft. at its top and about 10 ft. high, extending diagonally between two high points of land, was constructed, which raised the water 6 ft. to 8 ft. and submerged approximately 1000 acres. A canal, varying from 15 ft. to 20 ft. in width and from 6 ft. to 10 ft. in depth, unwallled and with large rocks remaining in it, extended about 100 rods from a sluice gate in the dam to a basin at the iron works.

The fall of water from the sluice gate to the basin was slight, but the total fall from the basin to the river below was in the neighborhood of 50 ft. The basement of the iron works was about 30 ft. below the basin, so that by this arrangement the upper story was on, or practically on, a level with the passage around the basin, which permitted charcoal and bog ore to be fed easily into the upper part of the blast furnace.

Slag from the furnace and cinders from the bloomery or forge were taken from the basement and dumped at the south end or side of the works, and until recent years remained a conspicuous reminder of the industry that once flourished there.

Supposition is that the works was driven by a water wheel, 30 ft. or so in diameter, turning in a pit outside the building, which transmitted its power to whatever point desired by a horizontal shaft.

As to Furnace Output

From the sowes, run in the basement, wrought iron and steel were made in the bloomery. This bloomery was nothing more or less than a blacksmith's forge having a charcoal fire 4 ft. thick into which an end of bar or sowe iron was thrust and in time became a pasty mass of wrought iron, settling at the bottom of the bloomery. Other portions of the bar were converted into steel when the process stopped at the intermediate stage between cast and wrought iron.

In the machine shop the first fire engine built in America, for the then "Towne of Boston," was constructed, as were improved grass scythes and other farming implements, under the directing hand of Joseph Jenks.

No authentic record of furnace or casting output has been handed down to posterity, the value of production statistics not being appreciated in Joseph Jenks' day. The first reference to output we have is where, in May, 1645, the court recorded that "some tons of sowe iron is cast in readiness for the forge."

Under date of March 15, 1647, Robert Child, who was connected with the works, wrote to John Winthrop,

Jr., then in Connecticut: "We have cast this winter some tuns of pots, likewise mortars, stoves and skellets. Our potter is moulding more at Braintree as yet, which place after another blowing we shall quit, not finding mine there." On Aug. 4, 1648, Governor Winthrop wrote his son that "the iron works goeth on with more hope and now yields about seven tons per week." In the following month, he wrote: "The furnace runs eight tons per week and their bar iron is as good as Spanish."

The General Electric Co.'s. Lynn, Mass., River Works iron foundry, located, one might say, within gun shot of the site of the old Saugus Iron Works, produces an average of about 150 tons per week. That tonnage does not include the output of the company's large steel and brass foundries at West Lynn.

Needless to say, the output of the Saugus Iron Works furnace never equalled that of the General Electric Co. iron foundry, but there is proof that its castings' output exceeded the needs of the stockholders and of the people residing in its immediate vicinity. It, therefore, was necessary for the company to enlarge its selling field. In serving outside markets the iron works' management found it difficult and expensive to transport castings over the roads to Boston and elsewhere. So the products were taken down the Saugus River in small boats, transferred to sailing vessels and by them conveyed to points further along the coast.

Joseph Jenks, or Jenckes, as he spelled his name, was largely responsible for the success of the iron works. As master mechanic, he was active in the erection of the works, dam, etc., and he made the molds in which castings direct from the furnace were made. In addition to the honors attached to the construction of and practice at the iron works, he bore the distinction of being the first builder of machinery in this country, and of having received the first patent issued in America. The wording of this patent, which is herewith given, is interesting inasmuch as it gave Jenks latitude, which in these modern law-making days, would not hold water, and be of no protection whatever to him.

at a generall Court at Boston
the 6th of the 3th mo 1646

The Court considering ye necessity of raising such manufactures of engines of mills to go by water for speedy dispatch of much worke with few hands, & being sufficiently informed of ye ability of ye petitioner to pforme such workes grant his petition (yt no other pson shall set up, or use any such new invention, or trade for fourteen yeares without ye licence of him ye said Joseph Jenkes) so far as concerns any such new invention, & so as it shalbe always in ye power of this Court to restrain ye exportations of such manufactures, & ye prizes of them to moderation of occasion so require

Just what the "engine of mills" referred to in the patent applied is unknown. Possibly the patent referred to mill improvements as applied to water wheel systems used as motive power, but it is also possible the reference is to fire fighting engines, for we find that a few years later Mr. Jenks built a fire engine to the order of the selectmen of Boston, the first to be built in the country.

At the time he was granted a patent for "engines of mills," Mr. Jenks applied for a patent on an improved grass scythe, the form of which is followed in manufacturing practice to-day. The English scythe blade was short and thick like a brush scythe, heavy and tiresome to the user. Mr. Jenks lengthened the blade considerably, making it thinner, and welded a square bar on the back to strengthen it. His patent was not granted until nine years after his application, but this fact did not discourage him. From Richard Leader, manager of the iron works, he bought the privilege of building a forge at the works for the manufacture of the scythes, as well as other edge tools and mills, and had considerable success in the sale of the scythes.

While he was thus actively engaged he made the for the Pine Tree shilling, the first money coined in this country. One authority says that Mrs. Jenks made the drawings from which her husband made the dies. About 20 years after he took out his first patent, Mr. Jenks sought aid to establish a wire manufactory, but he appears to have been unsuccessful in this at-

tempt, the court and the investing public either lacking confidence or being too busy with other things to give encouragement. He died at Lynn, in 1683, aged 81 years.

THE IRON AGE is indebted to G. S. Bliss, publication department, General Electric Co., West Lynn, Mass., for photographs accompanying this article.

Champion Engineering Co. Additions

The Champion Engineering Co., builder of cranes, has begun a series of extensive additions and improvements to its plants at Kenton, Ohio, and upon the completion of the building program, present production will be trebled. The improvements include extensions to the foundry, new structural steel fabricating shops, inclosed storage and modern raw material storage. Every building will be equipped with traveling electric cranes. A tool and jig manufacturing plant entirely independent from the production department will be constructed, and also a pattern vault and steel foundry to relieve the present gray iron foundry equipment. A new power plant will be built of sufficient capacity to take care of present as well as future power requirements.

Provision is also made for the construction of a house building program for the employees. Fifty homes will be constructed immediately on a plot located in the middle of the grounds.

In close proximity to the new homes will be built a company hotel, which will also form a civic center. For the present the hotel will accommodate 50 people, but will be provided with an auditorium 30x100 ft., with baths, gymnasium, billiard and pool tables, and bowling alleys.

Lackawanna Company Earnings Improved

An increase in both profits and unfilled orders is indicated in the report of the Lackawanna Steel Co. for second quarter of 1920 over the second quarter of 1919. Profits this quarter were \$1,881,946, contrasted with a deficit of \$233,086 the second quarter of 1919; unfilled orders amounted to 484,267 tons the 1920 quarter, against 122,399 tons a year before. Total net earnings after taxes and ordinary repairs were \$2,786,107, compared with \$446,757 the year before.

At the end of the first quarter of this year there was a deficit of \$449,720, though the unfilled orders were slightly greater than at the end of the second quarter, being 492,519 tons.

The company also contrasts earnings the first half of this year with those of the first half of 1919. They were \$1,432,225 this year and \$974,022 last year.

New Company to Make Non-Ferrous Alloys

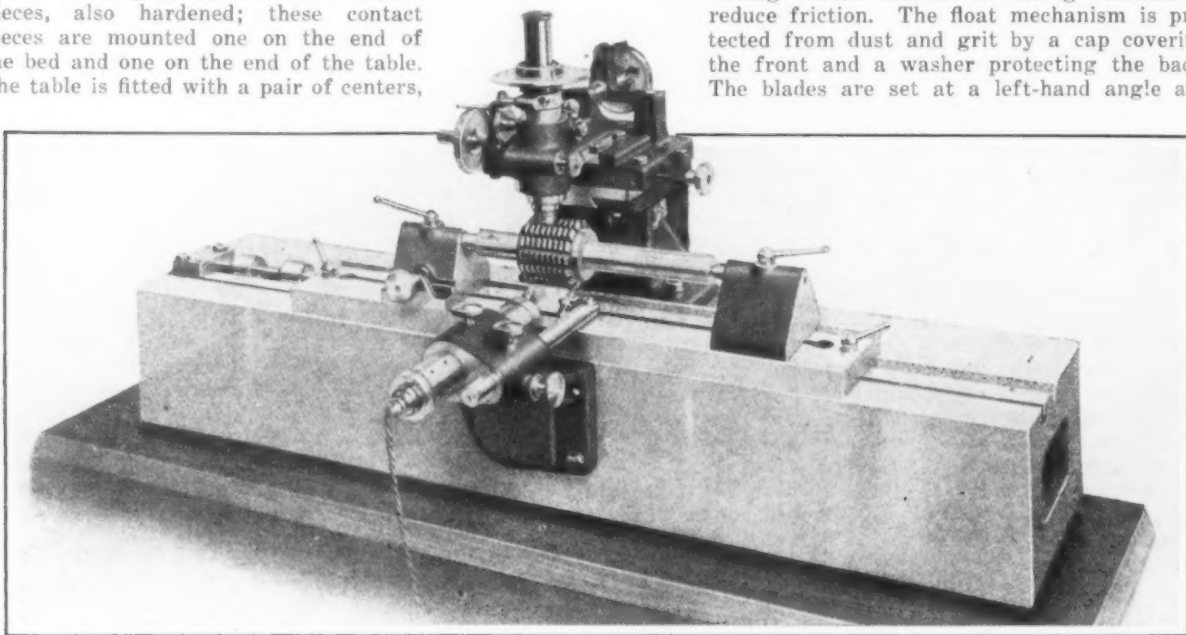
A new maker of white metals is the Pan American Smelting Works, Brooklyn, N. Y. A building of brick, concrete and glass, 75 x 150 ft., has recently been completed on the corner of Calyer and Moultrie streets. To facilitate the handling of incoming and outgoing shipments, the loading floor was built truck-floor high. Babbitt metals, phosphor alloys, type metals, solders and white metal alloys are the main products. They are marketed under the following trade marks: Castwell, Aero Marine, Standard U. S. Genuine, Durabel, Flowell and Rapid Transit. The president of the company is George Stoll who, previous to the organization of the Pan American Smelting Works, was connected with the United Metals Corporation (Syracuse Smelting Works' Subsidiary) as assistant to the president. Mr. Stoll recently returned from a two years' trip to the Orient and the Far East in the interests of this firm. Abraham Saffer is the treasurer. He has had 15 years' experience in the metal business and was formerly purchasing agent for the Fidelity Metal Co.

"Reamings" is the title of a new house organ published monthly by the Wetmore Reamer Co., Milwaukee, in the interest of the company's salesmen and distributing houses. Among its features are news about the factory and outside men, talks on reamers, matters of sales policies, and comments on operating troubles and their remedies.

Microscopic Measuring Machine

A machine designed to provide an accurate means for the measurement of screw-thread tools, form tools, gages, threaded work and similar articles is being introduced into this country by Alfred Herbert, Ltd., Coventry, England, with an office at 54 Dey Street, New York. The machine is adapted for measuring lengths, angles and pitches. It does not depend on screws for its accuracy, but upon end measuring rods and large-dial micrometers graduated to 0.0001-in. It is explained that the measuring rods which are used in making all length measurements maintain their accuracy indefinitely and can be readily checked by well-known means.

A box bed carries a table capable of 12-in. movement by accurate amounts through the insertion and removal of standard hardened steel measuring rods of known length between flat contact pieces, also hardened; these contact pieces are mounted one on the end of the bed and one on the end of the table. The table is fitted with a pair of centers,



Machine for the Accurate Measurement of Screw-Thread Tools, Form Tools, Gages, Threaded Work and Similar Articles. It depends for its accuracy upon end measuring rods and large dial micrometers

one of which is adjustable in a crosswise direction to enable work to be lined up accurately.

A microscope with vertical movement by rack and pinion for focussing is mounted on a compound slide rest, with screw movement parallel with the slides and at right angles to the table slide. The microscope is fitted with two hair lines across its diameter, one rotating with the outside tube and the other rotating with the eyepiece.

The outer tube carries a large dial graduated in half degrees. The eyepiece carries a vernier, which enables readings accurate to one minute to be made. Thus the angle between the two hair lines is indicated with fine commercial accuracy.

A light projector is fixed to the machine to project parallel rays of light through a lens upon a mirror placed at an angle and so past the work. When measuring threads this attachment eliminates shadows and light projected from the flanks of the thread which tend to make the object indistinct. The mirror is adjustable to suit the lead of the thread, and enables the object to be clearly defined through the microscope. Eight-volt accumulators are required for this attachment, but are not included in the standard equipment.

The table is 22 in. by 3 3/4 in.; greatest length measured, 12 in.; maximum diameter of work, 3 in.; magnification of microscope, 25 diameters; overall length of machine, 36 in.; overall width, 10 in.; overall height, 18 in.; approximate net weight, 214 lb.

The Stanley Belting Corporation, 32 South Clinton Street, Chicago, has been appointed special distributor for the Bull Dog shaft couplings and collars, made by the Safety First Mfg. Co., Alexandria, Va.

Cylinder Reaming Sets

A new cylinder reaming set has been added to its line of reamers by the Wetmore Reamer Co., Milwaukee. The set consists of a roughing reamer, semi-finishing reamer and a floating finishing reamer.

The roughing reamer has adjustable and replaceable blades set at a right hand angle.

The semi-finishing tool has left hand angle blades like the standard Wetmore floating reamer to eliminate "digging in" and "chattering," thus to produce a round hole that is not scored when backing out, leaving an ideal condition for finishing. A modification of this reamer is designed for line and pilot reaming.

The floating finishing reamer has a feature in that the float is in the head of the tool directly under the strain, thus to eliminate tendency to get out of parallel or cramp. The float is an improved Oldham type, having rollers instead of sliding contacts to reduce friction. The float mechanism is protected from dust and grit by a cap covering the front and a washer protecting the back. The blades are set at a left-hand angle and

staggered. Expansion and adjusting to thousandths of an inch are made by a graduated micrometer lock nut located at the rear of the blades. Present standard sizes are 2 7/16 in. to 5 9/16 in.

The Piscataqua River Bridge Commission has appointed the Strauss Bascule Bridge Co., designer of movable bridges, Chicago, as consulting engineer to design the superstructure of the interstate highway and electric railway bridge to be built across Piscataqua River, connecting Portsmouth, N. H. with Kittery, Me. The bridge will consist of three spans, each 300 ft. in length, the center one being a Strauss double leaf bascule. The bridge will be paid for by the states of New Hampshire and Maine and the United States Navy Department. Gov. John H. Bartlett of New Hampshire is secretary of the commission. Commander E. H. Brownell, Portsmouth Navy Yard, represents the Navy Department, and L. B. Jones, bridge engineer of the State of Maine, represents that state's interests in the project.

The business of the firm of David S. Foster, Sons & Co., Utica, N. Y., iron, steel and hardware, was formally transferred July 1 to Gerard S. Foster and Burt A. Rogers. The death of David S. Foster was noted in THE IRON AGE of July 1. The business will continue on the same site on which it has been conducted for more than 100 years.

The New York, Ontario & Western Railroad has awarded to the Standard Repair Co., Somerset, Pa., the repairs of several hundred coal cars.

The Production of Good Iron Castings*

Three Fundamental Conditions—The Sulphur Problem—Use of Sea Coal—Selection of Pig Iron and Scrap

—BY DR. RICHARD MOLDENKE—

ANY discussion on the production of good castings will always bring out at least two strong viewpoints. There is that of the purchaser of these castings who invariably wants them to be perfect and cheap. Only in times like these must he take practically what is given him and at figures set by the foundryman. These times, however, will not remain very long, and the foundryman will shortly be confronted again with strict demands for smooth surfaced, sound, strong and machinable work at low, competitive figures. Hence the importance of keeping up quality production in spite of the temptation to let everything pass out of the shop.

From the standpoint of the foundryman it is equally essential that the work produced should be of high quality, for every rejected casting costs as much as the corresponding good one, and yet, on remelting, has only scrap value, for it can be replaced thus in the open market. Few foundrymen realize that molten metal wasted in unnecessarily large risers and pouring basins, spilled and "over-iron" comes under this category and should therefore be reduced to a safe minimum. For this reason also should the breaking in of new men be followed up carefully to judge whether within a reasonable time each man has made sufficient progress to justify the further losses still ahead before adjudging him a skilled operative. Molding is an art, even if a machine performs a part of the work, and not every man is gifted with the necessary qualifications.

From the view-point of the nation as a whole, it is essential for the economic advance of our industrial life that the pound of iron be made to go further than ever, and hence the indiscriminate use of masses of low grade metal must give way to less material of higher grade in construction work of modern design, consistent with the requirements of service and safety. It is incumbent, therefore, upon the foundryman to study every phase of the numerous processes involved in his work so that he may know himself to be industrially successful, as well as commercially so. There are few industries in which the chances of failure are so great and pit-falls are to be found at every turn. The slightest mistake at any one of the hundred different operations involved in the making of a casting may mean its loss, if not something more serious, and only the resourceful and energetic man may strive to become a successful producer of good castings.

The Three Fundamentals

In general, the subject under discussion may be briefly summed up under three heads. First: It is necessary to work with good materials in foundry procedure. All melting processes are necessarily oxidizing in character to a greater or less extent, and hence an "off" pig iron or "burnt" scrap is not subject to improvement by remelting. Again, a molding sand full of fluxes may mean disaster to the surface of a heavy casting, while high sulphur coke will surely increase the scrap pile. Second: Even with the best of materials good results will not be achieved unless these materials are put through the necessary processes with the required degree of skill and attention. Hence good molds must be made from the right kind of sands, and the mold surfaces must be properly finished and blackened. Good pig irons and carefully selected scrap must be charged judiciously and melted under practically perfect furnace conditions, so that when the molten metal is tapped out, the foundryman may be certain that it could have been no better for the class of work in hand.

Finally, the gating of the molds and riser arrangement should be planned and carried through with scientific accuracy, if such a term may be used in a foundry. Then the carefully selected materials which have been melted under exact charging and blast conditions and have yielded a molten metal full of life will be given a fair chance to be converted into castings free from undue internal shrinkage, casting strains and other trouble.

The above three points are the fundamental ones the foundryman must constantly bear in mind, and if followed out carefully by properly trained men, should lead to good castings produced economically. Of what avail is it to fill up a floor with molds only to lose a large percentage through sand troubles; or to make fewer but perfect molds and lose a lot of castings by oxidizing metal through poor melting; or with perfect molds and excellent molten metal to get castings full of internal shrinkage through improper feeding opportunity as the result of poor gating. Unfortunately, in the last mentioned instance, the defects are usually not discovered until the castings have failed in service. The foundrymen cannot be too watchful in all these operations and must insist on every care on the part of the operatives, for his own good and that of the buying public. A more detailed discussion of these three fundamental points will, therefore, seem not amiss at this juncture.

The Sulphur Problem

The tragic industrial condition of the world during and since the war is perhaps best illustrated in the foundry. With pig iron and coke almost beyond reach and necessarily poorly made; with labor below all comparison with anything the foundry has ever had to suffer in its history, no wonder there is a surfeit of abominably high sulphur, low grade work in existence which is accumulating trouble in the industry for this and the generations to come. It will require a high order of industrial education to cope with the situation when the castings made since the war began appear in the scrap pile. As the strain in our industries tapers off, the furnaceman will again obtain better fuels and ore and can, if he will, furnish better-made pig metal. Competition will eventually bring the foundryman better fuel, and it is only the scrap which he has to buy that will give him serious concern as regards his raw materials.

While a high pig percentage in the mixture helps overcome the sulphur difficulty to some extent, this is not always practicable in times of sharp competition, and hence only a thorough knowledge of cupola charging and melting will give fairly satisfactory results in spite of the scrap handicap. Since it is possible to make servicable and machinable castings with sulphur as high as 0.30 per cent, provided everything else is correct, there is no reason why the foundryman should not be able to hold his own. There are, however, few foundrymen who are posted so thoroughly and can work in the exact routine the necessity of the case demands. Hence there is bound to be much disappointment ahead.

The question of molding sand is becoming more serious in some sections of the country. The best deposits are verging upon exhaustion, and there is need of more careful sand preparation in the shop, to correct the difficulties with the natural product. Europe is ahead of us in this particular, in many instances all of the sand used daily going through machines for regrounding and mixing. Thus, after removing the burnt sand adhering to the casting as shaken out, and with the most economical use of sea-coal,

*An address delivered at the convention of the Southern Metal Trades Association at Atlanta, Ga., June 20-21.

enough new sand is ground in to keep up the quantity and bond of the heaps to standard. While the eventual solution of the sand problem lies in preparing it artificially, from even-sized rounded grains of clean silica coated with high refractory and fat clays, much can be done by grinding the natural sands to promote their uniformity in texture and bond. As time goes on, foundrymen will demand better sands, and the sand merchant will have to add equipment to his plant to produce the goods. In the meantime, however, foundrymen will do well to test their sand-heaps regularly for fineness, strength and the bonding value of the clay content. Further, they should classify their work into light, medium and the heavy grades and arrange the sand heaps accordingly, and see that these heaps are not mixed. A fine sand mixed with a coarse one simply reduces the venting power of the latter without giving very much smoother work.

As regards the finishing of the mold surfaces, there is this much to be said. Molding sand is composed of three distinct ingredients: namely, the silica grains, the clay substance forming the bond, and the fluxes that are unavoidably present. Originally a granite, the decomposition of this rock due to natural causes has given the unaltered quartz, or silica grains; and the feldspar and mica portions more or less completely decomposed. The fully decomposed portions have formed the clay substance, and the undecomposed parts contain the alkalies which count as fluxes. Unless the percentage of fluxes is very low, the molding sand is bound to stick to the surface of the castings poured into it, particularly if the sections involved are quite heavy. To prevent, or at least counteract this as much as possible, it is necessary to cover the sand surface with a film of refractory material which will allow the easy peeling off of the burnt sand when the casting is shaken out. The best material for this film is graphite, and while used universally for the so-called "blackening" of the mold, there is nevertheless much still to be learned on the subject of making this film adhere to the sand and resist the washing action of the molten metal.

The Use of Sea-Coal

The fact that only the immediate surface of the mold is subject to the intense heat and corrosive action of the molten metal, and not the main body of the mold itself, would seem to imply that the use of sea-coal for mold facing sand purposes is a somewhat crude make-shift and expensive at that. This all the more when these sand surfaces are afterward finished off with graphite. Instead of preparing perhaps a quarter of an inch of the sand pressed directly against the pattern with sea-coal mixed in rich proportion, fully two inches of sand are often used, and as most of this goes back into the sand-heap, the bond in this is correspondingly weakened.

The ideal method is to remove as much of the burnt sand as possible with the casting, replace with new sand—using no sea-coal—mixing up the heap thoroughly and finishing off the molds made with graphite blackening of proper quality. In this way the bond of the heap will be kept practically up to that of new sand and the usual difficulties met with when poor backing sand comes in contact with hot metal washing against it are avoided. It may not be possible from the nature of the work to apply this method, nor have we sufficient information as yet regarding the manner of coating the mold surfaces so that the graphite will not wash away to a greater or less extent. The preparation of the mold surfaces is, however, one of the big problems of the foundry that must be solved in the future, and our investigators would do well to give it the necessary study.

The Making of Cores

The making of cores is also a fruitful field for study. In effect, a core is the counterpart of a dry-sand mold without the protecting envelopment of the flask. The core is at least partially covered with molten metal and must have exceptional venting facilities to allow the escape of gases formed during the pouring process. With high strength and permeability to air and gases,

the core must be so constituted that it will disintegrate at the contact surfaces as the metal sets so that this may contract without danger of rupture. The selection of the sands and binders used in coremaking is, therefore, most important, the ideal method being to get a mixture as low in clay content as can be used successfully, with the binder evenly distributed and in lowest safe quantity.

The drying should be sufficiently long to accomplish two purposes. First, to evaporate all the water contained. Then to subject the binder to the maximum temperature it will stand before losing its value. In this way the cores will not only be dry and therefore not "blow" if vented properly, but they will not be so apt to absorb moisture from the damp mold body and give trouble. Cores, particularly the large ones, are usually made with too much molding sand or loam in the mixture. There is also the tendency to feed in too much burnt core material. The consequence is a core so hard that the resulting castings are at least badly strained if not actually cracked.

The Selection of Pig Iron

Pig iron should be selected on the general principle that the closer the analysis of the iron approximates to that of the castings, due allowance being made for oxidation and the scrap content, the better the chances for uniformity. In other words, it is not good to mix irons high and low in silicon or manganese, or to combine "off" irons with the fine charcoal grades. A study of cupola melting will show that there is no chance for actual mixing within the cupola until the metal passes out of the tap-hole. The presence of the incandescent coke in the crucible of the cupola prevents any movement of the molten metal while held there. Again, as the metal passes over the spout into the ladle, the churning action within this is not deep. Hence it is quite possible for high and low silicon metal to remain entirely apart even in the actual casting, and many are the notable examples of different compositions in large castings for which the mixing and charging was defective. Far better to have the metal yard filled with average analysis requirements, and but little of the high and low material for adjustment purposes.

Scrap bought for the foundry should be scrutinized carefully and all oxidized material refused. Eventually rigid specifications will rule in the scrap market so that when buying machinery scrap every piece will show evidence of tool action. As long as charcoal irons are obtainable, they will give the foundryman valued service for special lines of work, particularly for low silicon requirements as in chilled rolls, crusher parts, balls, etc. Also for very light work requiring great strength and elasticity. The fuels used in the foundry to-day are manifold. Coke, coal, gas and oil, with electricity just ahead. Eventually coke with less than 14 per cent ash and 2 per cent sulphur will be again obtainable, and the relief will be correspondingly great. It is regrettable to see so much coke storage in our foundries out in the open. The bed coke must be kept dry in any case, and so long as the intermediate coke charges are measured in order to get a fair approximation to the weight, the water contained does not matter, particularly with very light and highly cellular varieties. Where, however, water or ice is weighed and charged as fuel, the consequences are all but pleasant.

The analysis of castings for all classes of work is now pretty generally known, so that the foundryman should have little difficulty in selecting his irons. In his mixture-making, he should not be too economical of good metal and must select his scrap with utmost care.

Metal Patterns

Turning next to the processes through which the well-selected foundry raw materials are converted into good work, the most important will be those of molding and melting. The constantly widening application of the molding machine, as a consequence of the decadence of the skilled molder, and the necessity of supplanting manual labor wherever possible on general principles anyhow, has brought about a closer study of the pat-

tern question. Metal patterns are now the rule instead of the exception—wherever weight does not militate against this. This development makes for increased accuracy and also facilitates the mounting and special arrangements for quantity production. Jarring machine development has extended the use of cores, amounting in effect to an amplification of dry-sand molding methods. The result of it all has been economy in labor, lost castings and excess weights. Not only has the molding time been shortened materially, but the equipment necessitated has operated for smaller losses chargeable to the molding floor. The regrettable feature of the situation is the passing of much of the loam-molding talent formerly available, and this class of work is now confined practically to the very largest lines of work.

A further word about molding sand. The essential items to be considered are the following: The finer the grain size of the silica content of the molding sand, the smoother the work. Necessarily the poorer the venting quality. Heavy castings, therefore, are made in coarse sand. The rule is to use as fine a sand as the work will safely stand. Again, the rounder the grain,

the better the venting. Hence, apart from the question of bond, a round-grained sand is to be preferred—particularly with inexperienced molders, as this can be rammed harder safely.

The bonding material of the sand—the clay substance—is most important. If strong, 5 to 10 per cent is sufficient; if weak, 20 per cent may be necessary. So high a proportion, however, means the filling up of the venting spaces and consequent trouble. Fortunately nature has attended to this situation, and coarse sands usually have less clay and fluxes than the fine ones. This clay bond, besides being very adhesive when dampened, should also be highly refractory, or free from fluxing impurities, and hence the definition of a good molding sand would be "one of uniform size, rounded grains of quartz, each grain coated with a minimum amount of a strong, refractory clay." Nature, unfortunately, does not provide a theoretically perfect sand, and hence it is one of the problems of the future to improve existing sands, if not to actually build up artificial sands with practically perfect quartz grains and fire-clay combination.

(To be concluded)

The New Alloy of Magnesium

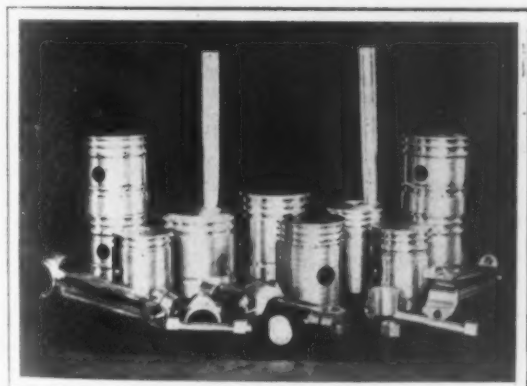
Lightest Metal Yet Used for Pistons in Automobile and Aircraft Work—The Method of Its Manufacture from Magesium Chloride

BY E. J. JENKINS*

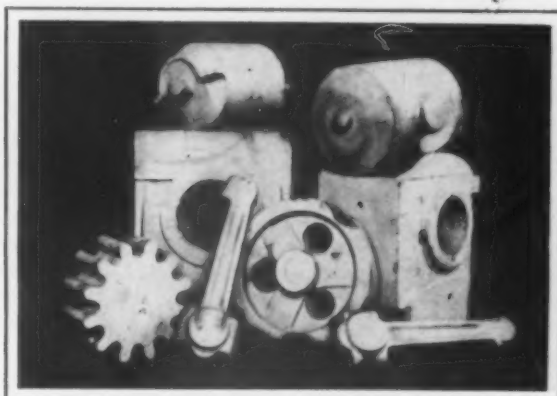
A NEW alloy, manufactured by the Dow Chemical Co., Midland, Mich., and called Dow metal, is the lightest metal known which is adapted to commercial uses. It contains over 90 per cent of metallic magnesium, which distinguishes it from all other light alloys now on the market. Others are composed

| | Oz. per Cu. In. |
|-----------------|--------------------|
| Dow metal | 1.04 |
| Alumite | 1.56 |
| Cast iron | 4.16 |

When the foreign supplies were cut off early in the war, the manufacture of metallic magnesium was



Group (Left) of Dow Metal Pistons, Connecting Rods, Bolts and Nuts, Illustrating the Brilliant Finish Which the Alloy Takes



Collection (Right) of Motor Castings, Liberty Aero Pistons and Connecting Rods of Dull Finish Dow Metal

largely of aluminum and contain magnesium, if at all, in small amounts. Magnesium is the lightest metal which, at the same time, has the tensile strength and the physical properties making it suitable for engineering uses.

This new alloy has been brought to the attention of engineers within the last year. Prior to the war, magnesium was imported from Germany and its main, if not sole use, in the United States was as a deoxidizing agent for non-ferrous metals. Dow metal is one-fourth the weight of cast-iron and all aluminum and aluminum alloys are 50 per cent heavier, or it could be said, magnesium is one-third lighter than aluminum. A comparison of the three main piston materials, as to weight in ounces per cubic inch, is as follows:

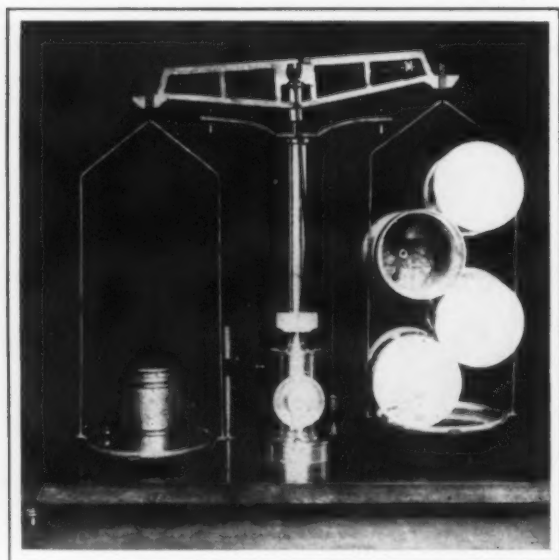
undertaken by the Dow Chemical Co., there being unlimited amounts of the raw material in the brine pumped from its numerous wells, from which many other chemical products were manufactured. Among these manufactured products is the salt, magnesium chloride, which after suitable preparation is used for the manufacture of metallic magnesium. The process employed is electrolytic in which a heavy direct electric current is passed through a molten salt bath, maintained at a red heat until it is decomposed by the current and the metallic magnesium is formed which, on account of its extreme lightness, rises to the top, floats on the surface of the molten bath and is skimmed off from time to time.

Appreciating the fact that in the past the demand for magnesium was limited, because no alloy of it had been discovered which possessed the mechanical properties necessary for its use in practical construction of

*Dow Metal Department, Dow Chemical Co., Midland, Mich.

the parts in automotive and aircraft production where sufficient tensile strength with the other necessary qualities was needed, the Dow Chemical Co. established a research department and for the last five years or more this work has been carried on. Under the direction of Dr. W. R. Veazey, Case School of Applied Science, Cleveland, the chemists to make the first metallic magnesium at this plant were Messrs. Stafford, Collings, Burdick and Gann, and the alloying of this metal was then carried on by Veazey and Burdick until, after many tests, the present Dow metal alloy was obtained.

The main use found thus far for this alloy has been in the manufacture of pistons for automobiles and airplanes, as well as motor boats. Possessing a tensile strength of from 22,000 to 25,000 lb. per sq. in., it is also the lightest material used for such purpose, be-



Four Dow Metal Pistons Balancing One Standard Cast-Iron Piston

sides having no abrasive or scoring action on cast-iron cylinders and having approximately the same coefficient of expansion as other light piston alloys. Dow metal differs from aluminum as to the expansion under heat in a motor in that there is no permanent growth or set at these temperatures. Recent tests have shown that with 21 successive heats made of Dow metal for two hours each and for 0 to 800 deg. Fahr. the permanent growth is so minute that it cannot be detected with a micrometer.

In machining no cutting compound is used and with the lathe running at the highest speed, there is no tearing of the metal and no dulling of the tool by hard spots. The great resiliency of Dow metal is shown by recent tests at the Government laboratories at the McCook Aircraft Field, Dayton, Ohio, in which an Oldsmobile piston was placed in a vise and forced in one-fourth inch and, upon being released from the vise, came back to size with the exception of being only 0.004 in. out of round.

After the set-up is made in the lathe reports show that three Dow metal pistons are machined at the time formerly taken in machining one of cast iron of the same size.

The following table gives some of the more important physical properties:

| | |
|---------------------------------------|------------------|
| Specific gravity | 1.79 |
| Tensile strength, lb. per sq. in. | 22,000 to 25,000 |
| Yield point, lb. per sq. in. | 12,000 to 14,000 |
| Compressive strength, lb. per sq. in. | 45,000 |
| Elongation, 2 in., per cent. | 3.5 |
| Reduction in area, per cent. | 3.5 |
| Modulus of elasticity | 9,000,000 |
| Brinell hardness | 55 to 75 |

Where Dow metal is re-worked or rolled, drawn,

drop forged or heat treated, the tensile strength is increased at each operation. In heat treating, sand castings are increased from 22,000 to 25,000 up to 30,000 lb. per sq. in. or more, without causing any appreciable change in the yield point, while the elongation and reduction in area are increased to 6 per cent. In drop forging, the tensile strength is increased to 50,000 lb. per sq. in. and the Brinell hardness rises to 70 or better.

"The heat conductivity is 0.295, as compared with 1.000 for pure copper and 0.108 for cast iron. The coefficient of linear expansion, over a range from 0 to 800 deg. Fahr. is 0.000028. This coefficient appears to be high for a material to be used in pistons. However, this expansion is not accompanied by any permanent growth. In one test, a bar was submitted to 21 heatings of two hours each at 800 deg. Fahr., and it showed an increase in length of only 0.0003 in. per inch, an amount so small as not to be detected with the micrometer. In practice, pistons are fitted to the same clearances in the cylinder as are commonly given to aluminum pistons and, fitted in this manner, they have given entirely satisfactory service under all conditions."

The first real test of Dow metal pistons was made by the Dow Chemical Co. in its Ford roadster over a year ago. The car has been in constant service since that time and now has a mileage of over 20,000 miles and is still giving good service. At one time on a 5000-mile test, the gas consumption was 23¼ miles per gal. and the oil at the rate of one quart for each 100 miles. At the conclusion of the test, the piston showed very little wear and the cylinder none. Since the original test set of pistons were put in, many additional sets have been installed by the company in its own test cars and by a large number of private car owners. The sound of the Ford motor with Dow metal pistons is hardly recognizable. Recent tests in a plant of a well-known manufacturer of motors show that these motors developed six horse power more with the Dow metal pistons than they had ever developed before with any other material. In spite of the rather ample clearances with which these pistons are installed in the cylinder, no case of oil pumping has yet been recorded and the objectionable piston slap is absent.

Conneaut Shovel Co.'s Waste-Fuel Power

A power plant with interesting economy features has been installed by the Conneaut Shovel Co., Conneaut, Ohio, under the direction of G. W. Benton, president and general manager. The equipment, in addition to the auxiliary pumps, heaters, etc., includes two B. & W. boilers of 264 hp. each, and one compound vertical, two-cylinder Westinghouse engine developing 390 hp. at full load, direct connected to a 250-kw. generator.

All the drainage from the heating systems, from the many drinking fountains that supply spring water to the men and the condensation from the engine goes through a filter and heater and is used again in the boilers.

Shavings and waste wood are taken by conveyors from the handle plant and automatically fed to the boilers. When the handle plant is running full capacity, no coal is used. For emergencies two tanks on top of the engine room, storing 180 tons of coal, feed by gravity to the chain grate stokers. The coal is elevated from the track to the bins by a conveyor. The ashes from the stokers are dropped into a pit and are carried by conveyor to an ash bin storage. One man can operate the entire plant.

The Reading Steel Casting Co., Reading, Pa., a Pennsylvania corporation, has made a transfer of its property to the Reading Steel Casting Co. of New York, recently incorporated with a capital of \$3,000,000, following the acquisition of the Reading, Pa., company by the American Chain Co., Bridgeport, Conn.

Electric Motors for Steel Plants

In the steel plants the load characteristics of electrically driven auxiliaries, such as mill tables, screw downs, tilting tables, etc., are such as to require, on the part of both motors and control, a high degree of ruggedness, combined with a facility for rapid starting, stopping and reversing. Frequently in addition to the mechanical strain of sudden acceleration, a motor is subjected to severe physical shocks which are transmitted through the gears when driving such auxiliaries as manipulator fingers or side guards.

The *MD* and *MDS* lines of motors have been perfected by the General Electric Co., Schenectady, with a view to meeting these requirements. It is pointed out that the designers, however, in making the motors strong have not lost sight of the necessity of obtaining rapid acceleration and retardation.

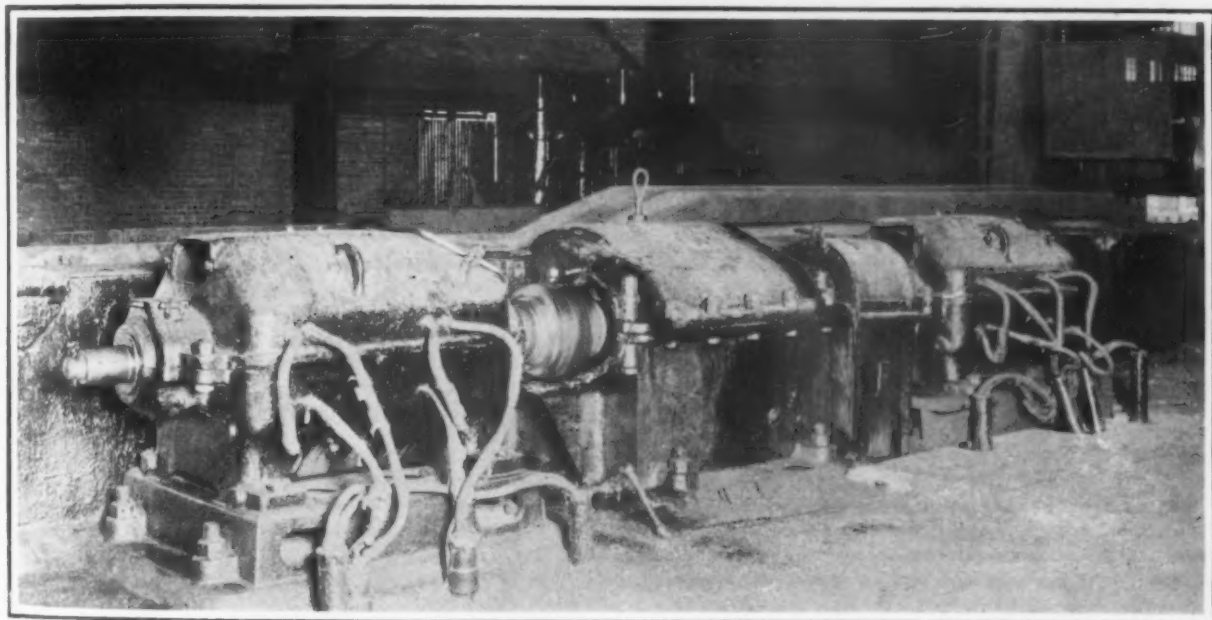
In order to reduce the fly wheel effect to a minimum, and still have a strongly constructed armature, which means a heavy one, the armature has been made long, and of small diameter, so the peripheral velocities are low, and rapid acceleration is made possible. As a result, it is stated, the power needed to accelerate an *MD* or *MDS* armature to full speed is only from one-third to one-fourth that required for ordinary motors of the corresponding horsepower and speed. One of the principal difficulties to be overcome is excessive heating, especially in the *MD* type, which is totally in-

leads. This construction serves further to protect the armature from damage due to careless handling when it is removed from the frame. In repairing an armature no particular attention need be paid to the question of balance.

The *MD* type motors are designed in sizes ranging from 4 to 175 hp. at speeds from 1100 to 400 r.p.m. at 230 volts and from 1350 to 475 r.p.m. at 550 volts. The *MDS* or open frame type of the same motor ranges from 6 to 210 hp. and speeds from 1150 to 420 r.p.m. on 250 volts and from 1375 to 440 on 550-volt circuits.

The starting panels designed for use in steel mills are supplied with devices, contactors, etc., emphasized as simple in construction as possible, and so designed as to give a high factor of safety. The double pole main line switch may be locked open to prevent accidents or for inspection, and the reversing contactors are mechanically interlocked. The master switch is totally inclosed and may be installed for either horizontal or vertical position of the handle.

The Cooper Hewitt Electric Co., Hoboken, N. J., announces the development of a new type of auxiliary for use with its alternating current lighting units, which has raised the power factor of these lamps from 52 to 85 per cent. This has been accomplished by replacing the choke coils of the former auxiliary by a positive low



Two MD 100-Hp. Series Motors Operating the Rear Line Table of a 36-In. Blooming Mill at the Plant of Trumbull Steel Co., Warren, Ohio

closed. This has been overcome by using mica and asbestos insulated bars for the armature coils, together with sheet mica in the slots, and mica tape on the ends. Further protection from heat is afforded by ventilating ducts in the punchings, and by a complete ventilation system in the case.

The *MD* motor is made in two halves, so that the whole upper half, pole pieces and all can be thrown back, or lifted off, to expose the armature and bearings. Connections from one half to parts in the other half are all made outside the motor by flexible leads brought out through rubber bushings. The commutator sheet is mounted on the armature spider, so that the shaft can be removed without disturbing connections between the armature and commutator bars.

Rapid starting and stopping, and reversing by plugging from speeds as high as 500 to 1000 r.p.m. put a considerable mechanical strain on the armature and commutator. For this reason, instead of using binding wire on the armature, the coils are held in place by a heavy binding band and clamps, and the connections from the armature to the commutator are made by letting the ends of the coils straight into solid ears on the commutator bars, without the use of separable

resistance unit. There is a saving of 14 lb. in weight over the old type, and an increase in the allowable voltage variation, since the new lamp has a regulation of 25 per cent, while that of the old type was only 12 per cent. The wattage of the new lamp is 430, which has increased the candle power about 12 per cent. Since the tube will operate at 3.8 amperes direct current normal, a further slight reduction has been made possible, since the auto-transformer need not be as heavy as formerly.

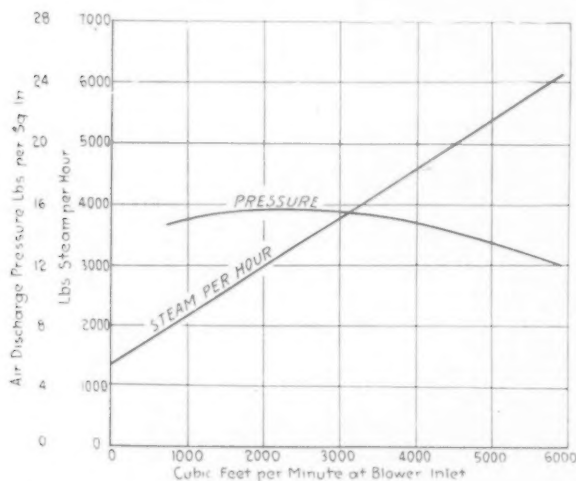
The new foundry building for P. & F. Corbin, New Britain, Conn., is about to be turned over to the company by the contractors. It is located in the rear of the Park Street plant in close proximity to the old foundry, and occupies a parallel position with the building erected by the Government on Chestnut Street, which now is the property of the New Britain Machine Co. The charging floors of the new and old foundry are connected by bridge. Spur trackage has been provided. Landers, Frary & Clark, of that city, have started operation of their second cupola, thereby bringing their daily coke requirements up to 8000 lb. The company has but three weeks' coke supply on hand.

High-Speed Turbo Blower

The turbo blower shown in the accompanying illustration weighs slightly over 4000 lb. and was manufactured for the Famatina Mining Co., Argentine, by the Rateau Battu Smoot Co., 140 Cedar Street, New York. The manufacturer advises that tests made of the blower before shipment showed that at a speed of 36,000 r. p. m. the machine delivered some 4000 cu. ft. of air at 21 lb. During its operation at full speed and overspeeds, the machine operated without appreciable vibration, it being quite impossible to obtain readings from a vibration tachometer.

The results of the test indicate that two units of this type working in series can be made to compress air at 100-lb. pressure in small units, and three units in series would give a compression as high or higher than 100 lb. for larger power machines. The results obtained are attributed largely to the fact that the rotors operate far below their critical speed, the critical speed of the machine being above 36,000 r. p. m. and the normal speed 22,000 r. p. m.

The compactness of the machine can be appreciated from the statement that the diameter of the blower is approximately 10 in. and that the entire blower end is composed of one wheel only. The turbine rotor comprises three wheels made integral with the shaft. The first wheel receives boiler steam, and two low



Characteristic Curves of New Rateau Battu Smoot High-Speed Turbo Blower

pressure wheels in parallel receive the steam discharged by the first wheel. The rotor of the blower is made in one piece of steel integral with the shaft, the blades being radial. Such a wheel, it is explained, has the maximum possible rigidity and is so designed that at all points the stresses are far below the elastic limit of the metal. Both rotors are connected by a rigid coupling. Bearings are lubricated by oil under pressure.

The flexibility of this machine is of interest as it can be operated from 1000 cu. ft. to 6000 cu. ft. and from pressures varying from 12 to 16 lb.

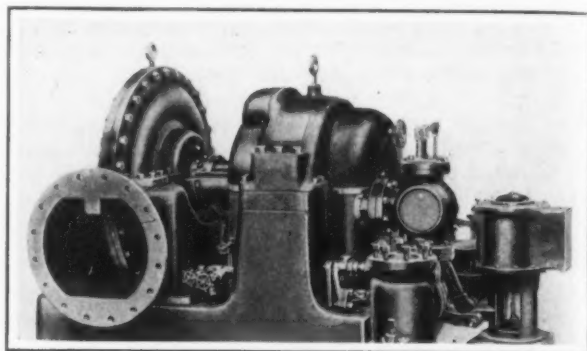
Cylinder-Bore Gage

A gage of improved type for determining the variations in a cylinder bore has been placed on the market by the Federal Products Corporation, Providence, R. I. Inaccuracies in the bore of a cylinder are indicated on a dial which is attached to a tubing with feelers or arms which are actuated by means of a cone cam directly connected to a steel rod that operates the dial hand. A button is provided which when pushed down, lowers the cone cam and causes the feelers to recede sufficiently to be inserted in the cylinder. When the feelers are inside the bore, withdrawal of pressure on the button automatically releases the feelers against the cylinder walls. One of the three feelers can be built up with extensions so that measurements can be taken of diameters of from 2.5 in. to 6.5 in. Usually before insertion the feelers are set to a standard diam-

eter or master, as it is called, while at the same time the face of the dial is turned until the hand is co-incident with the zero. The instrument is rocked from side to side in a manner similar to that employed with inside micrometers. The movement of the dial to the left or right, or as indicated on the dial, the minus or plus side of zero, indicates the variation either way from the standard diameter.

Mayor of Duquesne Sustained

Conviction of the six organizers and speakers of the American Federation of Labor, arrested last May in

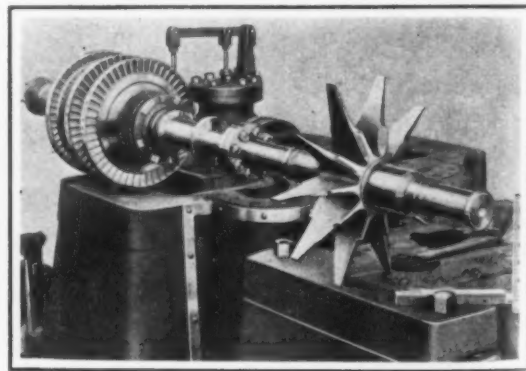


Turbo Blower Which, Under Test, Delivered at 36,000 R.P.M., 4000 Cu. Ft. of Air at 21 Lb.

Duquesne, Pa., for attempting to hold a public meeting without a permit, was sustained in a recent opinion handed down by Judge R. M. Kennedy in the Allegheny county court. They were ordered to pay a fine of \$100 each, and upon their refusal, they were sentenced to 30 days in jail by Mayor George S. Crawford of Duquesne. While sustaining the conviction Judge Kennedy reduced the fines to \$25. Counsel for the men announced that the case would be carried higher.

The court held that the mayor was well within his rights in declining to issue a permit for the meeting, and that refusal of a permit was not an invasion of the rights of the people, pointing out that if the meeting tended to provoke disorder the refusal of a meeting permit actually would afford them a protection and a preservation of their rights.

"It is true," said Judge Kennedy, "that the mayor



The Diameter of the Blower Is 10 In. and the Entire Blower End Is Composed of One Wheel Only

might have thrown a cordon of police around the meeting and permitted it to proceed, but the presence of police at such times is not always an assurance of peace, and if the mayor in his judgment deemed that impractical or unsafe, and felt the safer way was to forbid the meeting, how can his action, viewed in a broad sense, be regarded as an infringement of the rights of the people?"

At a meeting of Cincinnati machine tool manufacturers, held July 13, plans were discussed for exhibiting their products at the exposition to be held in Buenos Aires in November. It is understood that about 10 builders from that city will reserve space.

Progress Toward Trade with Russia

Conditions Which Are Still to Be Adjusted—Status of Russia's Gold—Some Business by Barter Is Possible

BY STERLING H. BUNNELL*

THE removal of restrictions by the United States Government on trade with Soviet Russia is like opening the valve at the outlet of a disconnected system of piping. There may be a little dribble at the valve, or the pipe may be quite dry, but there will be no considerable flow until there is a supply from the source, and the pipes are again connected.

For weeks past conferences have continued in London between representatives of the Soviet Government of Russia and the British Government, for the purpose of arranging some method by which trade can be carried on between Russia and the world outside. Notwithstanding the admitted need of Russia for enormous quantities of railroad material, agricultural implements, clothing and textiles generally, and machinery for equipping industries, and the need of western Europe for the supplies of foodstuffs, hides and other raw materials and commodities formerly exported from Russia, the conferences have thus far failed of their object, and must continue further. With both sides anxious to reach a basis of agreement, the obstacles in the way are evidently formidable, in spite of the late report that arrangements seemed likely to be made.

Means of Production in Soviet Hands

The greatest stumbling block is the uncertainty as to whether private property has any definite rights in Russia. All means of production belong in theory to the Soviet state, including apparently all large and most small mines and factories, and everything except the peasants' implements of labor, and possibly a small amount of household furniture for each family. Of the larger warehouses and shops or stores, those belonging to individuals or corporations were confiscated first by the workmen and then by the state, and those belonging to the great co-operative organizations seem to have been absorbed by the state through the seizure of the control of the organizations by the Soviet authorities, with the imprisonment of those leaders of co-operatives who resisted. Trade in large fundamental activities like the supplying of agricultural implements and transportation has been made a Government monopoly. What British, French or American merchant will therefore risk the confiscation by the Soviet Government of a shipment of machinery to Russia, or a stock of goods for sale, or an office or warehouse establishment? Every precedent indicates that this would be done with or without alleged cause, at any moment the Soviet Government might in its wisdom decide that such robbery of an individual would be to the advantage of the people under its control.

Title to Russian Gold

Answering this objection to the opening of trade, the Russian negotiators propose that the Soviet Government shall be the direct purchaser, and shall definitely engage to pay for its purchases before they leave the owners' possession. Payment must of course be made in gold or goods exported from Russia. But the gold in the possession of the Soviet Government consists in part of the reserve of the former Russian empire, which was pledged to secure the currency and debts of all the Russias. This currency the Soviet Government has debased by huge inflation, and the debts it has repudiated. The foreign holders of Russian obligations now claim title to the gold reserve, which is the only undepreciated asset remaining behind the Russian national debt. Another part of the Soviet gold offering consists of the gold placed by Roumania in Petrograd "for safe-keeping" during the German

invasion. It is impossible for a plain American to see any sense in the apparent reasoning of the Soviet leaders that the gold which they say belongs only to the laborers who did the physical work of production, may by a breach of trust be taken from those producers for the benefit of another set of workers in another country, who did not produce it.

While the fine points of Bolshevik ethics had only theoretic interest in England, where there was no large Bolshevik fund in reach, lively practical action has just been taken in other countries where Soviet money is on deposit. Swedish merchants whose branch establishments and goods were damaged or seized by the Russian authorities have demanded that Bolshevik funds in Stockholm be held as security. Denmark discovers that a large shipment of gold coin from Soviet Russia for deposit in Copenhagen consists of Roumanian 20-lei pieces, worth about \$4 each, and therefore cannot avoid recognizing Roumania's claim to ownership. France has served general notice on all nations that trading on any basis of payment in gold from Russia will be subject to the prior claim of France for money loaned to Russia during many years past, much of it used in building Russian railroads and municipal establishments and service systems. Our own Federal Reserve Board issued a warning some time ago that attempts to trade with Russia by means of payment through banks in the new Baltic states of Esthonia, Latvia and Lithuania would be unsafe because of the clouded title to all moneys coming from Russian sources at present.

Possibilities of Trade by Barter

However, trade by the barter of Russian goods for imports was offered as the solution of the problem. All the gold which is supposed to be in the Russian reserves would pay for only a small part of the imports Russia needs, whereas the enormous natural resources of Russia has always given her ample purchasing power, before the disorganization of war and Bolshevism. The Soviet emissaries in London proposed to use gold deposits in Scandinavian countries as a revolving fund, paying for imports by check against those deposits, and replacing the funds by money to be received from the sale of Russian exports. But it has become clearly evident that there is now no great quantity of commodities available for export. The surplus grain which was shipped abroad in pre-war days has not been replaced from the scanty crops, reduced acreage and disturbed living conditions of the last two or three years, so that western Europe fears a shortage. The hide offering has fallen off with the general decrease of cattle. Production of flax, bristles, various seeds, furs and skins and other commodities that come from individual peasant industry has diminished to almost nothing with the decreasing supply of manufactured goods needed by the peasants.

As for the large industries like mining of metals and production of oil, these have fallen off to the point of barely producing what can be used locally or transported by the crippled railroad system to nearby cities. What stocks of peasant-produced commodities remain, and these must be in the aggregate considerable, are in the more remote districts where transportation facilities are least, because goods which did get to ports or within easy reach of water transport were long since picked up by small traders and carried in coasting ships to ports in other countries where salable return cargoes could be had. The same old physical blockade of the huge interior territory of Russia continues to exist, and negotiations alone cannot remove it in the lack of railroad material, with decreased river shipping and dimin-

* of engineer R. Martens Co., Inc., New York.

ished horse and cattle transport between the railroad and river terminals and the peasant villages in the interior.

The Value of Russian Concessions

All these facts, of course, are known to the Soviet Government, and could not be expected to be unknown to the leaders of other nations to-day. It may well be that the offer of gold and goods in trade is only a cover for an attempt to sell important concessions in Russia to private interests outside. As far as such concessions may relate to undeveloped mines, oil-bearing lands and other resources, the only objection from the foreign capitalists might be the weakness of the title in case of a change of government, or a change of heart in the Soviet Government. But the properties proposed for sale to foreign capital include railroads, factories and resources, some developed by Russian citizens, others by foreign capital, and all confiscated by the Bolshevik state. The title to such property is certainly not unclouded, and would hardly be secure to any present English or French purchasers against suits by former owners in England or France, or against suits by former Russian owners in Russia in case of change to a form of government recognized by other nations.

Credit is the only means that can re-establish international trade with Russia. Whether or not the Russian "comrades" are willing to remain forever mere pawns under the absolute control of an oligarchy instead of a czar, to work, fight, live and die as commanded by the Soviet state, they must borrow from the free citizens of outside nations the capital which is the savings of the free labor of those nations, in the form of locomotives, agricultural tools and other manufactured goods. And to succeed in an attempt to borrow, the Russian leaders must convince the lenders that the debt will be paid. Bankruptcy alone is permitted to discharge a debtor from the obligation to pay, and bankruptcy involves the loss to the debtor of all rights in whatever assets he may possess. The Soviet authorities must eventually come to the point of accepting the obligation to repay those who formerly lent the money which built up modern Russia, or they must admit inability to pay and invite their foreign creditors to come in and repay themselves out of the undeveloped natural resources of the country.

Soviet Government May Accept Terms Quickly

There is strong evidence that the acceptance of the necessary conditions by the Soviet Government may come soon and suddenly. Progress has been marked by the elimination of the use of the huge gold reserve, the title to which is not clearly in the Soviet Government or indeed in the Russian population, and of the fiction that the accumulated stocks of three years or more of normal production lie in Russian ports in easy reach of shipping. Neither gold nor goods are ready in any great quantity for use in payment for imports into Russia. The Bolshevik Government must obtain relief for its oppressed subjects through successful negotiation or it will fall. If it does come to terms, these will mark a long step from Bolshevik ethics toward the accepted standards of at least nine-tenths of the world's inhabitants.

The needs of Russia have been stated so many times that every American manufacturer is familiar with most of them. The demand is so great that inquiries have never ceased to come out, in the face of the fact that no actual trade has been possible. Such inquiries ought not to be left unanswered. Even though our own railroad transport is congested and manufacturing throttled in consequence, and the course of prices of materials and labor in the future is uncertain, manufacturers at least can send catalogs and quote present prices subject to change, in answer to inquiries indicating interest in Russian business. The trouble with most export managers is that they fail to use their imagination. An inquiry from Riga or Vladivostok for harvesting machinery could not possibly be filled in time for this year's harvest, even though the inquirer may not realize it when writing. A reply quoting a price somewhat below the present market, reserving

the right to change without notice, will serve the inquirer's purpose as well as a binding quotation, because he will not make up his mind or provide the necessary dollar credit in time for this season's business, and in any case would ask for the latest price when finally ready to order. What such an inquirer really wants is to familiarize himself with what is offered in America after the lapse of four or five years since the closing of import trade.

Those who know Russia best are the most firmly convinced that the present condition there is transitory, and that as the enormous experiment of Bolshevism has proved so disastrously that the system is unworkable, its present leaders must very soon revise their principles or give place to another government. The revision has proceeded, in fact, a long way. If it goes on to the extent of announcing responsibility for the Russian debts and restoring the rights of private property and contract, the last obstacle to trade with Russia will be removed. After that the repair and reorganization of Russian industry will keep American and European shops busy for years to come.

Exports of Metal-working Machinery

WASHINGTON, July 20.—Exports of metal-working machinery to England during May were valued at \$1,334,132. This included lathes valued at \$246,812, other machine tools valued at \$445,605, sharpening and grinding machines, \$67,202, and other metal-working machinery valued at \$574,513.

Exports of metal-working machinery to France were valued at \$609,006, including lathes valued at \$75,499, other machine tools valued at \$230,167, sharpening and grinding machines valued at \$68,917, and other varieties valued at \$234,432.

Exports of metal-working machinery to Italy were valued at \$309,174, including lathes, \$24,685; other machine tools, \$107,397; sharpening and grinding machines valued at \$8,622, and other metal-working machinery, \$168,470.

Exports of metal-working machinery to Canada were valued at \$466,442, including lathes valued at \$90,665, other machine tools valued at \$140,893, sharpening and grinding machines valued at \$26,943, and other kinds valued at \$207,941.

Molybdenum in Norway

Molybdenum ore is mined in 16 localities, and a company has been formed to take over the many small prospecting concerns which flourished during the war, owing to the high price obtainable for the metal, but which are now in difficulties, according to *Teknisk Ukeblad*, Feb. 13, and abstracted by *Technical Review*, London. It is intended to manufacture the new tool steel, introduced by Professor Arnold in Sheffield, in which 6 per cent of molybdenum is used in place of 18 per cent of tungsten, with the result that the cutting power is far superior to any at present in use. A profitable outlet for all the molybdenum found is confidently expected as soon as the manufacture of this steel is established.

Shipping by Rail

ASHLAND, WIS., July 19.—Due to the shortage of bottoms and the extraordinary demand for pig iron, all of the output of the four furnaces of the Charcoal Iron Co. of America, located at Ashland, Wis., Boyne City, Newberry and Manistique, Mich., is being shipped by rail instead of by lake, as has been the custom for years. Last season only one cargo of pig iron was forwarded by water, this being from the Boyne City furnace to a Lake Erie port.

The Lebanon Steel Foundry Co., Lebanon, Pa., has inaugurated operations at its second electric furnace, using energy at 13,000 volts. The furnace is of 800 kw. type, 2-ton capacity, capable of turning out 12 heats, each of this amount, per day, and at which capacity it is now being operated. This is triple the output of the other electric furnace at the plant, of same tonnage rating.

Signers of Non-Union Agreements Protected

Cincinnati Court Holds That Unions Must Not Attempt to Persuade Employees to Break Their Contracts—Important Bearing on Present Strike

A VERY important decision was handed down by Judge Hickenlooper in the Superior Court at Cincinnati on July 12. The legality of the non-union agreement under which some metal-working plants are operating was upheld, and a permanent injunction restraining members of labor unions from interfering, in any way whatsoever, with persons signing those agreements was issued. The decision is expected to have far-reaching consequences, as at the present time a strike of machinists is in progress in some of the machine tool establishments, and the claim is made that many employees are being kept away from work by interference from strikers. The decision referred to two cases, that of C. J. Shafer, doing business as the C. J. Shafer Pattern Works vs. International Pattern Makers League of North America, et al., and that of John Douglas Co. vs. the Metal Polishers International Union, local No. 63, et al.

In the case of the Shafer Pattern Works, it appears that plaintiff had run an open shop until about five years ago when he ceased to employ any union men. A number of plaintiff's employees, although not all, signed separate so-called non-union agreements whereby it was agreed that, in accepting employment with the plaintiff, the employee did so upon the understanding that the employer did not recognize and would not have any dealings with a labor union, and that the employee would not become a member of any such labor union while in the employ of the plaintiff and would have no dealings, communications or interviews with officers, agents or members of any labor union in relation to membership by the employee in such labor union or in relation to the employee's employment. It was shown in the Shafer case that in the early part of September, 1919, the defendants commenced a campaign of organization through which it was sought to increase the membership in the local pattern makers league or union; that as a step in the accomplishment of this purpose the plaintiff's place of business was picketed by the union employees of other shops, and plaintiff's workmen were accosted, principally upon leaving work, and asked to quit plaintiff's employment and join the union. Defendants had notice that many of the plaintiff's employees had signed the non-union agreement and that all of plaintiff's employees were employed upon either a verbal or written agreement that they would not join the union while in plaintiff's employ, or, if they decided to join the union, that they would at once withdraw from such employment.

The Exact Question Involved

"The exact question in this case," said Judge Hickenlooper, "is whether after the plaintiff's shop had been run as a non-union shop for more than four years, the defendants had a right to so conduct their campaign for membership, by the maintenance of pickets and a solicitation of plaintiff's employees, as to injure the plaintiff's business and deprive him of the services of his present employees, and this at a time when there was no strike in progress at plaintiff's shop, and no disagreement between plaintiff and his employees as to wages or working conditions, and when all of plaintiff's employees are employed upon the understanding and agreement that they would not join the union while in plaintiff's employ, and if it be decided that the defendants were within their rights in approaching any of the plaintiff's employees, will an injunction issue against soliciting such employees as have signed the non-union agreement above referred to.

When Picketing Is Legal

"It is our opinion that, in the absence of contract for a definite term of employment, the advantages to

society which are claimed for unionism furnish the just cause or excuse for the intentional injury occasioned by a strike. If, therefore, the employment be at will and the advantages of organization constitute just cause and excuse for persuading others to join the labor movement, it follows that picketing is not *per se* illegal and it further follows that the court must reject as unsound the dictum of the *Hitchman* case (245 U. S. 249) that inducing a servant to quit his employment, which is at will, may be enjoined where there is no contract restricting the employee's right to enter into the attending negotiations. We do not consider, therefore, that it is unlawful for the union to use peaceful persuasion for the purpose of inducing those of the plaintiff's employees who have not signed the non-union agreement, or verbally agreed to its terms, to quit their employment and join the labor movement.

"But to induce another to breach his contract has never been held to be justified by either social or individual advantage. No guaranteed right of free speech or liberty of action has ever been held to authorize or justify one man in inducing another to break his contract. Nor is the alleged non-union contract illegal or contrary to public policy. Any employee has the right to agree with his employer that he not only will refrain from joining a union during the term of employment, but he may also lawfully agree, as was done in these cases, that he will not have any negotiations or communications with others as to such employment during the period that he is so employed. Inducing such employee to enter into negotiations, or to participate in discussions as to the advantages of the union or as to his then employment, is inducing a breach of the contract into which he has entered; and such negotiations, conferences or discussions can not be initiated or started by defendants without liability for inducing such breach of contract. As has been said before, the advantages to the union cannot be held to be a justification of such act. The most that could be said to those who are employed under the non-union agreement in question is that, if and when their employment has terminated, the union representatives would be glad to discuss with them the advantages of the union. This is a meager and unsatisfactory right for which even the union does not contend.

Injunction Made Perpetual

"It follows that as to the Shafer case the injunction must be made perpetual as to initiating or commencing negotiations, dealings, communications or interviews with any employee who has signed the non-union agreement, either in relation to the membership by said employee in the union or in relation to said employee's employment. As to those who have not signed or entered into said non-union agreement, prohibiting such communications and interviews, such employees may be approached upon the subject of terminating their employment and thereafter joining the union. Since the court finds that there was no coercion or intimidation, either actual or threatened, there is no necessity for a restraining order upon these points. It is further ordered that each party pay their own costs herein incurred.

"A somewhat different state of facts exists in the case of the John Douglas Co. In that case the polishing and buffing department of the plaintiff was run as an 'open shop' until October, 1919, when an agreement for a 'closed union shop' was presented to the superintendent of plaintiff, closely followed by the demand on the part of some of the employees for an increase in wages. Several of the increases demanded were given, but the demand for a 'closed union shop' being rejected, a

strike was called by the local union on Oct. 28 and has been in progress since that date. Subsequent to the calling of the strike the plaintiff declared its intention of running a 'closed non-union shop,' and all of plaintiff's present employees have signed the non-union agreement above mentioned. Notice of this fact was brought home to the defendants.

Picketing and Violence

"The court finds as a matter of fact that the picketing of plaintiff's shop has been attended with frequent acts of violence, threats, abusive language and other coercive and intimidating acts on the part of the defendants, culminating in a brutal assault upon two of plaintiff's employees on April 9, 1920, by four members of the defendant union.

"As to prospective employees of the plaintiff, the union may use peaceful persuasion in order to induce them to abstain from accepting employment. This, it would seem, would be the only legitimate function of pickets at or about the plaintiff's works, but because of past acts of violence and abuse an injunction may be issued restraining the defendants from abusive language, threats, violence, coercion and intimidation against or toward present employees and prospective employees alike."

Hence, in the case of the John Douglas Co., the injunction was perpetual as to all threats, violence, abusive language, coercion and intimidation toward employees or prospective employees; restraining the defendants from accosting or from commencing interviews, communications, dealings or negotiations with any of the present employees relative to membership in the union or relative to their employment.

Cincinnati Strike Conditions

CINCINNATI, July 19.—While the machinists' strike is still on, there are indications that from now on improvement will be shown. When the strike was at its height in the second week of May, slightly over 6000 men were out, but a canvass of the situation reveals the fact that to-day the number of men absent from work numbers under five thousand. It was confidently expected that by this time the men would see the futility of remaining out, but the demand for men in other lines of industry has given some of them an opportunity to get steady employment, and as a result they are slow to return to their old positions. A number of men have left the city to seek employment in other centers, but these have not been as successful in obtaining suitable work as they were led to believe, and some of them have returned to the city and taken their old jobs back.

During the past two weeks a number of plants which had been closed entirely since May 1 have started work with about 30 per cent of their old forces, and these are being added to each day. These plants will be operated strictly as open shops, and men employed will be asked to sign the non-union agreement now in effect in some of the larger shops. The employers' executive committee, representing 85 machine tool and metal manufacturing plants, is confident that conditions will soon show improvement, as it is estimated that the majority of the men on strike were not in favor of it, and remain away from work only through their dislike to being bothered by pickets and officials of the union. The decision of the Superior Court restraining the pickets from interfering in any way whatsoever with men employed in the shops is expected to have a wholesome effect, and the results of it are already seen in the records of several plants during the week, where a fairly large number of the old hands reported for their positions.

The strike up to date has been a costly one from an economic standpoint. While no attempt has been made to estimate it from a monetary standpoint, it will amount to a large sum. When the strike started, the plants were anywhere from two to four months behind in their deliveries, and since that time, owing to the fact that they are unable to state definitely when deliveries could be made some cancellations have been received.

The impression has apparently gone abroad that all of the plants in the Cincinnati district have been affected by the strike, but such is not the case. Out of a total of about 140 plants engaged in the metal-working business, many have had very little trouble. About 20 shops were closed down temporarily, but these are now operating with a fair number of men at work. The employers are holding firmly to their declaration of principles made last April not to have any dealings with the unions, and are prepared to fight the closed shop to a finish, as they insist that they must be permitted to run their own shops in their own way for the best interests of all concerned.

Last Year's Strike Record

WASHINGTON, July 20.—The steel strike of last year, together with the coal strike, helped to make the year 1919 a record year in respect to the number of persons involved in strikes. This is shown in complete data relative to strikes in 1919 which have just been compiled by the Bureau of Labor statistics.

There were 3253 strikes and 121 lockouts in 1919, a total of 3374. This total was greater than in 1918, but less than that of 1916 and 1917. In 1918 there were 3232 strikes and 105 lockouts, a total of 3337; in 1917 there were 4324 strikes and 126 lockouts, totaling 4450; while in 1916 there were 3681 strikes and 108 lockouts, a total of 3789.

The iron and steel workers' strike, involving, according to the figures of the Bureau of Labor Statistics, a total of 367,000 men, and the coal strike, involving 435,000 workers, helped to boost the total involved in strikes in 1919 to 4,112,507. Besides a record number of persons involved the number of work days lost in 1919 was much greater than in any previous year, and the average duration of strikes was twice that in each of the preceding years.

There were nine disturbances in 1919, in each of which 60,000 or more persons were directly concerned. These included, in addition to the steel and coal strikes, a general strike in Tacoma and Seattle in sympathy with the metal trade strikers in which 60,000 were involved; 100,000 longshoremen along the Atlantic coast; 100,000 employees of ship yards, and a strike of 250,000 railroad shop workers. In 1916 there was only one strike involving as many as 60,000 employees; in 1917 there was none with more than 40,000, while in 1918 there was only one with as many as 60,000.

The total duration of strikes in 1919 was 57,885 days and of the lockouts 2215 days, the average duration for the former being 34 days and for the latter 38 days. The total duration of strikes in 1918 was 28,779 days and of the lockouts 1116 days, an average duration of the former of 18 days and the latter 31 days. In 1917 the total duration of strikes was 25,077 days and of lockouts 1904 days, the average being 18 days and 56 days respectively. In 1916 the total duration of strikes was 46,305 days and of lockouts 3375 days, an average for the former of 22 days and the latter 64 days.

There were 125 unauthorized strikes in 1919 involving 1,053,256 strikers.

Iron and steel workers were involved in 67 different strikes in 1919 as against 72 strikes in 1918, 56 in 1917, and 72 in 1916. There were eight lockouts involving iron and steel workers in 1919 and two in 1918, none in either 1916 or 1917. There were 424 strikes involving building trades in 1919 as against 416 in 1918, 447 in 1917, and 376 in 1916. There were 18 lockouts involving building trades in 1919 as compared with 16 in 1918, 21 in 1917 and 18 in 1916. There were 327 strikes involving metal trades in 1919 as compared with 439 in 1918, 513 in 1917, and 547 in 1916. Lockouts involving metal trades were two in 1919 and two in 1917, with none in either 1916 or 1918.

Of the 1919 strikes, 999 involved an increase in wages, 554 an increase of wages and decrease of hours, 366 recognition of the union, 178 recognition of wages and hours, 127 recognition of wages, 141 discharge of employees, and 106 a decrease of hours only.

Out of 1961 strikes reported as terminating in 1919, 624 were settled in favor of employers, 533 in favor of

employees, 729 compromised, in 42 the employees returned pending arbitration, and in the remaining 33 the result was not reported. Of 68 lockouts ending in 1919, 18 were settled in favor of employers, 16 in favor of employees, 11 compromised, in three they returned pending arbitration, and the remaining 20 results were not reported.

Accidents in War Time

WASHINGTON, July 20.—The steel industry is given credit for endeavoring to keep accidents down to a minimum during the rush of war activity in a review of industrial accidents by Lucian W. Chaney of the Bureau of Labor Statistics of the Labor Department. Mr. Chaney says that the attitude of the steel industry in this respect was in marked contrast with that of some other industries.

"Periods of high industrial activity are necessarily those in which accident rates will tend to rise," says Mr. Chaney. "During the period from 1906 onward there have been three conspicuous periods of this kind. They are approximately 1906-7, 1912-13, 1916-1918. The death rates per 1,000,000 hours worked, in the mills under consideration, have been since 1910 as follows: 1910, 0.70; 1911, 0.60; 1912, 0.63; 1913, 0.67; 1914, 0.47; 1915, 0.37; 1916, 0.50; 1917, 0.40; 1918, 0.53; 1919, 0.40. It will be observed that these figures have high points in 1910, 1913 and 1918, with depressed intervals between. The important point to be noted is that the pre-war high point of 1913 is higher than the war high point of 1918, the proportion being 67 to 53; that is to say, the tendency to rising rates which war conditions brought about was either opposed by more effective safety measures or was intrinsically less than that existing in the pre-war period. It may fairly be urged that the explanation is to be found in the improved construction of the new buildings and machinery which were installed in response to the war demand and in the active efforts put forth in training and introducing the new man who had to be employed.

"A considerable number of industrial concerns took the position that the demands of war production were so imperative that they were perfectly justified in relaxing attention to safety measures of all sorts. The result is reflected in the increased accident occurrence registered by most agencies. Whether or not this increase brought the rates generally above the pre-war standard is a matter which cannot be determined with certainty.

It is to the great and lasting credit of the iron and steel industry that it did meet the situation directly and endeavored to combat the inevitable tendency by increased efforts. The final outcome of these various efforts was first to check the rising accident rates and finally to bring them down to points lower than the pre-war level."

Highest on Record

James H. Nutt, secretary of the Western Bar Iron Association, states that the new rate of \$17.26 per ton for puddlers, which will prevail in July and August, is the highest in the history of the industry. During 1893 and 1894, puddlers worked in Youngstown on a wage scale as low as \$3.50 a ton.

The Union Twist Drill Co., Athol, Mass., is to pay its employees a bonus, based on length of service and July 1 to Dec. 31, 1919 earnings, as follows: One year or less, 4 per cent; one year and less than three, 6 per cent; three years and less than five, 8 per cent; five years or more, 10 per cent. The bonus will be paid as soon after July 1 as is possible.

A lodge of the Amalgamated Association of Iron, Steel and Tin Workers has been formed among employees of the Newton Steel Co., Newton Falls, Ohio. As the company is making a special grade of sheet steel, local agreements will be formulated by the new organization and presented to the management for its consideration.

The Field of Labor

Contract has been let by the Carnegie Steel Co. for the construction of 24 five and six-room houses at McDonald, the model settlement created for employees of the McDonald works in Trumbull County, Ohio. These dwellings will be of brick, tile and stucco and are part of an extensive building program undertaken by the company at McDonald. A number of duplex houses have been built by the company this year at this location.

Iron and steel industrial plants in the Mahoning Valley are supplying their employees in part with their coal requirements for next winter, at prices substantially below market quotations. The Carnegie Steel Co., for instance, is selling coal to its workers at \$5.75 a ton, whereas the market price is from \$10 to \$11. The domestic coal supply in the Valley is so scant that mills are obliged to act this year to meet the situation, though the practice of furnishing employees with fuel has been in effect for a number of years.

Judge Darby, in the Court of Common Pleas, Cincinnati, has ordered E. B. Woodward, receiver of the Domestic Commodities Co., to wind up the affairs of that concern and pay a dividend, instructing him not to make any effort to compel stockholders to pay the remainder of their subscriptions. The company was formed by Norwood factory employees to combat high prices, and sold its stock at \$10 a share. More than 700 persons bought stock each paying half the amount, or \$5 a share. When the concern was placed in the hands of a receiver its assets realized \$3,000, leaving after expenses were paid but \$1,500 to pay claims aggregating \$9,000. The receiver found that individual suits would have to be instituted against each stockholder to secure the money due on the shares, and as the expense of such litigation would be more than the gain possibly could be, he recommended that no suits be brought.

When demands for increases in wages approximating forty per cent were refused, chain makers in three York, Pa., chain plants went on strike last week. The plants affected are those of the Victory Chain Co., the Diamond Chain Co., and Mundorff's Chain Co.

Return of molders and chain workers to their work in the Steacy-Schmidt Co. plant indicates an early break in the month-old strike which affected a half dozen York plants. The men had demanded 8-hr. days, 90 cents per hr. and a closed shop. The plant will continue to be operated on the open-shop principle, but hours have been reduced from 10 to nine, although there is a corresponding reduction in compensation.

The Norton Co., Worcester, Mass., is to establish a dental department in its administration building, where employees may be treated at a nominal price per visit and may receive advice free. Dr. Ernest P. Brigham will be in charge of the office. The Norton Co. is the first Worcester industry to establish a dental department.

The West Pullman plant of McCord & Co., manufacturers of railroad supplies, Chicago, which was recently closed by a strike, has resumed operation. Most of the men have returned to work without winning their demands.

The big lay-off of men at the Rock Island arsenal, Rock Island, Ill., which was scheduled for July 1, has been indefinitely postponed, as the Government has ordered all uncompleted orders to be finished.

Patrick Flynn, a miner employed by the Highland Coal Co., Somerset, Pa., achieved a wage record in June which is believed to have never before been surpassed by a mine workman in Somerset County. On a recent pay day, Flynn drew \$246 for two weeks' work. At this rate his gross earnings for a year would total \$6,840 or \$22 per day.

Indicating recovery from the railroad strike is the June payroll in the Youngstown, Ohio, district of \$7,723,330, a gain of \$1,422,874 over May. Bulk of the wage distribution was made by iron and steel pro-

ducers. The payroll for June, 1919, was \$6,530,814. For the first half of 1920, wage disbursements aggregated \$42,922,670, compared with \$42,441,654 for the corresponding period in 1919, an increase of approximately \$500,000 this year. The 1919 wage distribution was \$81,891,279. For the first half of 1920 it is at the annual rate of \$85,845,340.

The Directors of the Columbus, Ohio, Chamber of Commerce, have passed a resolution favoring the open shop policy and also a law prohibiting strikes by employees of all public service corporations.

The Crawley Book Machinery Co., Newport, Ky., has filed suit in the Campbell County Circuit Court against Amos Johnson, Dayton, Ky., to recover \$15,000 damages for alleged breach of contract. The plaintiff company declares that it entered into a contract on Jan. 17 last whereby it agreed to pay an increase in wages of 10 per cent and time and a half for overtime to the defendant. The defendant and other employees agreed not to go on strike during the year in which the contract was to be in force, or to picket the company's plant, or to molest it in any way. It is alleged that the defendant, within the year specified, violated the contract by inducing other employees to demand a 25 per cent increase in wages and a closed shop. The plaintiff claims that as a result of the hostility of the defendant and others, it was forced to close its plant on May 7.

The Standard Forgings Co., 80 East Jackson Boulevard, Chicago, with a plant in the Calumet district, has taken steps to assist its employees to reduce the cost of living. It has made arrangements to buy foods at wholesale and to keep staples at the plant, and has reached an understanding with a tailoring establishment. If the plan proves successful a community store may be established at the works, where other articles will be offered to employees at cost.

Announcement that plans were in contemplation under which employees of the Federal Electric Co., Chicago, would have a voice in the management of the company, was made by John F. Gilchrist, president, in an address delivered on June 26 at a housewarming at the concern's new plant, Eighty-seventh and State streets, that city. Mr. Gilchrist said: "We cannot give a definite outline at present of what the plan will be, but it will be in conformity with some of the new ideas of employees' representation."

After a strike lasting about 10 weeks, the machinists and tool makers of the Canadian General Electric Co., Peterboro, Ont., have decided to return to work on the terms and conditions offered by the company to the men before going out. The union held a meeting and officially called off the strike; about 90 of the men who were still out have returned to work during the last couple of days.

Machinists at the plant of the Otis Elevator Co., First Street, Harrison, N. J., declared a strike, July 13, with demand for wage increase of 18c. an hour, or from 82c. to \$1.

Molders and coremakers to the total of about 200, who have been on strike at the plant of the Weatherly Foundry & Machine Co., Hazleton, Pa., for more than a month past, are negotiating with the company for return to the shops. The men have asked for a wage rate of 87c. per hour.

From among the users, producers and sellers of pig iron at Chicago, a representative group has been brought together with a common interest in golf. To develop on an informal basis the acquaintance of those who are continually doing business with each other in the iron and steel trade is a hoped for object. The name "Pigs in Clover" suggests the general idea. Richmond Nicholas of Hickman, Williams & Co. is secretary. The July "adventure" has been arranged for Wednesday, the 28th, at the Midlothian Country Club. Dates for August, September and October will be announced.

Coal and Coke Production

WASHINGTON, July 20.—Evidences that coal and coke production are finally getting back toward normal are contained in the weekly report of the Geological Survey.

The report covers the week ended July 10, which was a five-day working week because of the Independence Day holiday. The average rate of production of soft coal for the five working days was 1,961,000 net tons, the greatest attained at any time since the middle of last January. This rate is somewhat deceptive because it followed two days of light production, Friday and Saturday, July 2 and 3, and two whole holidays, Sunday and Monday, July 4 and 5, during which the railroads were able to catch up in their work of placing cars. That production is actually on the increase, however, is shown by preliminary reports of loadings in the first three days of the following week, July 12-13-14, which were at a rate of 5 or 6 per cent greater than that before Independence Day holiday.

The total production of soft coal during the week of Independence Day was 9,803,000 tons. This was a decrease of 490,000 tons below the output of the preceding week, but was not as great a slump as had been anticipated. That the production for the week was unusually good is indicated by the fact that the total was greater than in the corresponding week of either 1917 or 1919, and was only slightly less than in 1918. Production for the Independence Day week of 1917 totaled 8,766,000 tons, as compared with 10,119,000 tons in the corresponding week of 1918 and 7,459,000 tons with the corresponding week of 1919.

The holiday slump in the production of beehive coke was not as great as might have been expected. The total output was estimated at 363,000 net tons, a decrease, when compared with the preceding week, of 12,000 tons, or 3.3 per cent. The decline centered in Pennsylvania. Cumulative production of beehive coke since the beginning of the year is estimated at 11,269,000 tons, an increase over 1919 of 10 per cent.

The movement of coal to Lake Erie ports for transshipment to the Northwest again was unsatisfactory during the week ended July 10. The total for the week dropped back to 553,635 tons, the lowest since the first week of the operation of the Lake pools. Of the total dumpings at Lake Erie ports, 523,960 tons was cargo coal, and 29,675 tons vessel fuel. The decrease in cargo coal was 49,287, or 8.6 per cent. Shipments for the season by Lake now stand at 4,684,000 tons as against 9,470,000 in 1918 and 10,930,000 tons in 1919. With more than one-third of the season of navigation gone, the Lake movement is 50 per cent behind 1918 and 57 per cent behind 1919.

Report of Nova Scotia Steel & Coal Co., Ltd.

TORONTO, ONT., July 19.—For 1919 Nova Scotia Steel & Coal Co., Ltd., reported net earnings for its common stock, after all charges, including depreciation and allowance for the preferred, of \$904,877, equivalent to \$6 per share on 150,000 shares. This, compared with \$1,591,492 for 1918—equivalent to \$10.60. For the first four months of 1920 the operating profits, before depreciation and interest, were \$490,502, as against \$463,493 in the same period of 1919. The company has sufficient orders for steel on hand to cover production over the remainder of the year, and in addition the orders received for general service cars will enable the Eastern Car Co. to contribute its share of the profits. The proposed consolidation of the Nova Scotia Steel & Coal Co., Ltd., the Dominion Steel Corporation, Canadian Steamship Lines, and other smaller companies, under the term of the British Empire Steel Corporation, Ltd., has been approved by the stockholders of the first company. The average earnings of the three merging companies for the past three years have been in excess of \$16,000,000, which is at a rate of 8 per cent for the common shares of the new company after all charges and after preferred dividend requirements. After giving effect to the new financing, the consolidated balance sheet at Dec. 31, 1919, would show net quick assets of approximately \$43,000,000.

NEW PRIORITY ORDER

Commerce Commission Aims to Insure Coal Supply for Lake Region

WASHINGTON, July 20.—The Interstate Commerce Commission late to-day issued an order giving priority to the movement of coal from mines in Pennsylvania, Ohio, West Virginia, Virginia and Kentucky to Lake Erie ports for trans-shipment by water to the States at the head of the Great Lakes. The priority order is effective June 26 until further notice, which means presumably until the close of Lake navigation, about Nov. 1.

H. M. Griggs, manager of the ore and coal exchange at Cleveland, is made the agent of the commission to designate percentages of cars which coal producers must consign each day to Lake Erie ports before shipping coal elsewhere.

The order authorizes and directs the railroads in the transportation of bituminous coal and the supply of cars therefore, "to give preference and priority to carloads of bituminous coal consigned to H. M. Griggs, manager of the Ore and Coal Exchange, Cleveland, at any Lake Erie port for trans-shipment by water as a part of a pool or pools of Lake cargo or bunkering coal at any such port, and to place an embargo on the supply of cars for or the movement of all other bituminous coal in carloads to any other consignee or destination whatsoever."

The priority order aims to accomplish during the

remainder of the Lake season of navigation the movement of an additional 120,000,000 tons of bituminous coal from the date the order becomes effective.

New England interests are inclined to object to the proposed order. They fear it will interfere with the movement of coal to northeastern states. Those urging the order, however, point out that New England can get coal all the year around while such States as Minnesota must get their supplies by water during the season of open navigation, which closes on the Lakes about Nov. 1.

Involved in the proposition is the movement of ore. Representatives of the steel interests complained during the recent hearing before the commission relative to Service Order No. 7 confining the use of open top cars to coal that the shipment of ore from Lake Erie ports after being unloaded from vessels was made difficult by the order. The order if strictly applied prevents the use of open top cars for ore on their return trip from Lake Erie ports unless headed directly for the mines. This situation has not been taken care of to the complete satisfaction of those concerned.

There has been no further action in respect to Service Order No. 7 since that of last Tuesday extending the original 30-day period of its operation to 60 days, the date of its termination now being August 20, and modifying it by defining coal cars as not including flat bottom gondola cars with sides less than 36 inches in height, or cars equipped with racks, or cars which on June 19 had been definitely retired from service for transportation of coal and assigned to other service.

ACTIVE SHEET DEMAND

More Business Coming in—Ore Receipts in Mahoning Valley Slow

YOUNGSTOWN, OHIO, July 20.—While some jobbing interests in the Middle West report an easing up in sheet steel demand, it has not yet reached makers, who are not only sold ahead in this branch of the industry for a long period, but report fresh and sustained inquiries. The price spread on one-pass black, average sizes, ranges from 6.5c. to 9c., on galvanized from 7.50c. to 10c. and on blue annealed from 5.50c. to 6.50c. Rolling schedules of independent producers are still being maintained on a 75 per cent basis, despite an accumulation of tonnage conservatively valued at \$20,000,000.

Iron ore receipts have fallen off greatly, one large consumer having received only about 60 per cent of the tonnage usually stocked by the middle of July. While order No. 7, giving priority to coal movement, has been extended for 30 days, or to Aug. 20, the modification by the Interstate Commerce Commission, exempting flat bottom gondola cars with sides less than 36-in. in height, inside measurement, is expected to afford some relief from the acute car stringency.

Carnegie Steel Co. has been more seriously affected than any of the independents and its operations have sagged as low as 40 per cent. On July 17, all departments except blast furnaces suspended to permit employees to participate in their annual outing.

With settlement of the wage scale for sheet workers on a 5.75c. card for the July-August period, employees in this branch have received a net increase since Jan. 1, 1919, of 13.8 per cent.

Sheet Mills Suspend

At Farrell, Pa., the sheet units of the American Sheet & Tin Plate Co. have suspended because of scarcity of steel. The Pennsylvania railroad has imposed an embargo on outbound shipments which manufacturers say will work a great hardship unless soon rescinded. There are thousands of tons of steel ready to go forward, but no cars to move them. Blast furnace operators in the Shenango Valley are evincing concern over failure of the carriers to move cargoes of

iron ore from the Lake ports. Up to the present time the furnaces have received only a small percentage of the ore consigned to them.

At its Sharon, Pa., works, the Savage Arms Corporation, is installing a large amount of new machinery for one of the most complete forge and pressed steel plants in the country.

Action of the Interstate Commerce Commission in more fully defining coal cars is a clarifying factor in the local situation, as heretofore there has been much confusion as to the real interpretation that should be placed upon order No. 7. Railroads placed one construction, while the mills placed another, with the result that there was some lack of co-operation in utilizing what few cars were available for shipments.

No. 11 tube mill, the new lapweld mill of the Youngstown Sheet & Tube Co., is now approaching completion. It will have a capacity of 5000 tons of lapweld pipe a month.

The Niles plant of the Youngstown Steel Car Co. is pressed with repair work of all kinds and finds an unlimited volume of business of this character in sight. Capacity at present is being devoted almost wholly to repairs.

Pipe makers report warehouse stocks and stock of jobbers have been greatly depleted and shipments of oil country goods destined to jobbers are frequently diverted to consumers. Demand from this source is strong. An inquiry for 10,000 tons of pipe for export went the rounds of makers, but was rejected.

Decision Approved at Youngstown

YOUNGSTOWN, OHIO, July 20.—Award of the Railway Labor Board should prove to be a big stabilizing factor in the transportation situation of the country, say leading iron and steel makers, who anticipate a betterment in rail movements generally. The decision is welcomed by 18,000 railroad workers in this district.

Mattie Furnace of the A. M. Byers Co. at Girard has been banked. Sheet mills at the DeForest Works of the Republic Iron & Steel Co. are idle this week. Trumbull Steel Co. is operating all of its 44 sheet, tin plate and jobbing mills.

FRENCH OUTPUT LARGER

Production Increasing Each Week Despite Fuel Shortage and Railroad Difficulties

PARIS, July 1.—Although there are still difficulties with transportation, fuel and labor, iron and steel production in June was larger. The Comptoir de Longwy was able to meet the most pressing needs, and the mixed committee of producers and consumers of basic Bessemer pig iron took care of 60 per cent of normal needs. The production of plants is increasing each week. This is due to better shipments of coke and coal and also to improvement in the railroad transportation. The Lorraine companies in February and March produced only 20 per cent of their capacity, sometimes even less. Production at the end of May stands at 35 and even 50 per cent in certain plants.

The question is being asked to what extent the price cutting wave will affect the iron and steel industry. It is probable that within several months, in consequence of important shipments of coal and coke and the reconstruction of destroyed plants, production will increase considerably. France then being no longer tributary, as it is now, to foreigners for the purchase of semi-finished products, for which she must pay dearly, prices can reach a more normal level. However, opinion is that they will not drop very rapidly, seeing that fuel prices will remain high for some time yet and that needs are great. The new tariff for the hauling of metallurgical products shows some marked increases. Freight on a ton of pig iron, Longwy to Paris, has

gone up from 8 francs 15 centimes to 33 francs 25 centimes.

The impression in some circles is that the recent price cutting, so far as iron and steel are concerned, was only a case of speculation due to the improvement in French exchange and affecting only products in which trade is regulated in France solely by the prices of imports. In the case of non-ferrous metals, which has had no reflex on production in France, wherever prices have receded, it was due to accumulations in second hands.

In the face of declining prices buyers are holding aloof and are avoiding as much as possible the placing of orders of consequence until something further happens. This is only logical, as it is certain the high price limit has been reached and consequently there is no reason to buy for the future. But manufacturers are looking at the situation calmly, having in all branches reserve orders for many months to come, in spite of some cancellations. There is said to be no reason to look forward to an accentuated price decline, for the reason that English or American imports cannot yet compete, despite the decline in foreign exchange and ocean freight rates, and because there is no change in the elements of cost price in France, while the needs greatly exceed the capacity of production.

Comptoir de Longwy prices of pig iron for May held good for June and July as follows: Smooth No. 3, 650 francs; No. 4, 630 francs; No. 5, 620 francs; rough No. 3, 600 francs; No. 4, 597 francs; No. 5, 594 francs. Merchant iron and steel, base, 145 francs; beams, 1195 francs; rails, 1225 francs; average sheets, 2½ to 3 mm., 163 francs.

A Franco-Luxemburg Steel Merger

ESCH-SUR-ALZETTE, LUXEMBURG, July 1.—Details of an agreement of the Acieries Reunies de Burbach-Eich-Dudelange, familiarly known as "Arbed," with the firm of Felten & Guilleaume, were given out at a special meeting held here, at which it was also said, contrary to published statements, that no American group had assisted in financing the operation. "Arbed" was created in 1911 by the fusion of three mining and metallurgical companies, Societe de Mines de Luxembourg et des Forges de Sarrebruck; Societe des Hauts Fourneaux et Forges de Dudelange, and Societe des Forges d'Eich (Le Gallais-Metz et Cie). This combination, though powerful, was regarded as incomplete, the company lacking a base of supply for fuel. Consequently, at a special meeting previously held an arrangement was concluded with the Societe Charbonniere d'Eschweiler.

It was announced that this has had the best of results thus far, as it would have in the future when the company will have free disposition of the output of this colliery. But it was not solely from the coal standpoint that the directors regard the fusion as incomplete. The productive capacity of "Arbed" attains in round figures 1,000,000 tons of steel ingots. These are converted in its rolling mills into semi-products, also rails, beams and merchant iron of all kinds. Thus only a part of the production is converted into semi-products in its own plant. The other part comprising certain merchant iron, etc., is sold to rolling mills in the form of raw or semi-finished products.

The clientele constituted by these rolling mills is tending more and more to disappear, it was stated, either that the mills are in measure to fabricate themselves the products they need—and this is most generally the case—or that they have been absorbed by the existing large iron and steel companies.

The companies which possessed formerly only blast furnaces, in order to consume their pig iron have been led to add steel plants and rolling mills. Now they are obliged to seek the means of converting into finished products the semi-products which come from their rolling mills. This evolution, which was indicated before the war, seems certain to continue in the near future. And the time does not seem far off, it was declared, where in the iron and steel industry the mastery will

belong to those who not only will produce all or nearly all of the raw material that they consume, but will still push the conversion of their products to the extreme limit possible.

For these reasons the company decided to take an interest in the important cable manufactory, Felten & Guilleaume, whose products, it was stated, had a worldwide reputation and had attracted for some time the attention of the directors. For a number of years the Dudelange plant of "Arbed" had furnished the semi-products of Felten & Guilleaume. A combination had been planned more than once. Finally in 1912 Felten & Guilleaume, having acquired the works of Steinfurt, any alliance with the former seemed out of the question. But circumstances created by the war led Felten & Guilleaume to transfer the works of Steinfurt to a French group. From this time Felten & Guilleaume were in the same position as before—that is, obliged to buy in the market the raw materials necessary to their operations.

Negotiations were resumed quite naturally and resulted in an accord in principle, which needed only the approval of the stockholders and the companies interested in order to be definite. The Felten & Guilleaume company, whose nominal capital is 60 million marks, will increase it to 120 million marks. The new 60 million marks will be subscribed at a rate of 250 per cent, thus far a total figure of 150 millions of marks, by a group constituted by "Arbed," by the Societe Metallurgique de Terres Rouges and by the Banque Internationale de Luxembourg. The share of "Arbed" and the Societe de Terres Rouges will be each 70 millions of marks and the Banque Internationale 10 million marks.

The annual river outing of the employees of the Pittsburgh general offices of the American Steel & Wire Co. was held on the afternoon and evening of July 17. A trip was made down the Ohio river in a covered and decked barge of the company as far as Beaver. There was dancing and entertainment and supper was served in the hold of the barge. The committee in charge comprised G. A. Walker, manager of the invoice division, as general chairman; Capt. James Moran, superintendent of the river division, and Charles W. Lutz, assistant district manager of the wire mills.

PROFIT SHARING RESULTS

Why Some Plans Fail While Others Succeed— Real Tests Not Yet Encountered

"Practical Experience with Profit Sharing in Industrial Establishments" is the subject of a report just issued by M. W. Alexander from the office of the National Industrial Conference Board at Boston. The report is the result of a nationwide inquiry, including considerable field work, and aims to determine as far as practicable from actual experience the causes and conditions which make some profit sharing plans fail and those which make others succeed.

Since the field of profit sharing has generally been very loosely defined, the report carefully distinguished a true type from allied forms, such as wage bonuses, savings sharings, and stock subscription plans. It likewise differentiates between the limited type of profit sharing which applies only to managerial and executive employees and those plans that include the rank and file of workers.

The distinguishing feature of true profit sharing, it is pointed out, is that the amount of profits to be allocated to workers rises or falls proportionately with an increase or decrease in the profits realized. Its outstanding characteristics are: First, that the employer engages to distribute to his workers a share of net profits; and second, that the actual percentage of this participation is fixed in advance.

The development of profit sharing in France, England and the United States is briefly reviewed, and a large number of abandoned plans are discussed and the causes of their failure are listed. Plans now in existence in American industry are analyzed to ascertain methods employed to determine the percentage of net profits distributed; the eligibility requirements and the relative number of workers that participate under the plans; the frequency with which distributions are made and the form they take, whether stock, cash, or other; and what proportion of annual wages the allocated profit share represents.

The report, in fact, furnishes a means by which the American manufacturer operating a profit sharing plan can measure the accomplishments of his particular plan over against the accomplishments of many others. It likewise provides a basis upon which a manufacturer contemplating the introduction of a profit sharing plan can determine, through an examination of American experience both past and present, whether to introduce profit sharing and how to proceed.

Experience with true profit sharing plans, as outlined in the report, points toward two main conclusions: (1) Judged purely on the basis of their longevity, profit sharing plans are a doubtful expedient, since but few of the many plans put in operation have survived a long period of trial; (2) a critical examination of individual experiences, however, indicates an encouraging degree of temporary success. The reasons for abandonment of true profit sharing plans is found both in circumstances having nothing to do with profit sharing, such as a change in management or ownership, and in those connected with an unsatisfactory working of the plans themselves. Of the latter, apathy, dissatisfaction, and open hostility on the part of the workers loom large and were found in 50 per cent of the cases noted. Labor unions seem to be uniformly opposed to profit sharing, and difficulties are encountered particularly with unskilled and unintelligent workers. This experience would indicate that efforts at establishing permanently satisfactory relations between worker and employer might better be turned in other directions than that of profit sharing.

A study of the history of abandoned plans, moreover, strongly suggests the thought that plans now in operation, which have inspired enthusiastic testimonials of success, are only at one of the stages of the usual course of a profit sharing plan, that their real test has not come, and that eventually they may fall into disuse.

Each plan of supplemental wage payment is shown in the report to have disadvantages as well as advantages. As regards true profit sharing in particular,

there is much adverse experience to set against many successful attempts. Whether one form will serve better than another to secure the co-operation and interest aimed at, depends very largely upon such factors as the stability and profitableness of the enterprise, the intelligence and types of workers dealt with, whether or not they are unionized, and the nature of the product manufactured.

The two chief obstacles to a clear understanding and a full appreciation of profit sharing and its allied forms by the rank and file of workers are shown in the report to be the difficulty which the worker has in seeing the tenuous relationship between the efforts of individual workmen and the profits that accrue at the end of the fiscal period, and a confusion in the minds of the workers of the share of profits received with the wages paid. Those forms of supplemental wage payment which most clearly distinguish profits from wages are therefore most likely to avoid these difficulties.

Much valuable information is brought together to indicate to the American manufacturer what results may be expected and what should not be expected from true profit sharing plans. A number of interesting questions such as loss sharing, the promotion of thrift, trade union opposition, the relation of profit sharing to the prevailing wage rate, and why the worker's share in profits is so often confused with wages, are likewise discussed.

Wheeling Steel Corporation Officials

The newly organized Wheeling Steel Corporation with \$100,000,000 capital stock and as a merger of the Wheeling Steel & Iron Co., the Whitaker-Glessner Co., and La Belle Iron Works, is a holding company and the three subsidiaries will maintain their identities.

Isaac M. Scott, president Wheeling Steel & Iron Co., has been elected president of the new corporation, with Andrew Glass, D. A. Burt and W. H. Abbot vice-presidents. D. A. Burt is treasurer, and Walter Higgins secretary. Alexander Glass is chairman of the executive committee and A. H. Woodward vice chairman. Members of the committee also include C. R. Hubbard, A. C. Whitaker, J. J. Holloway, E. C. Ewing, Isaac M. Scott, and R. C. Kirk.

Directors of the new organization as follows: One-year term, 1921, Howard Hazlett, F. M. Work, E. W. Oglebay, Isaac M. Scott, A. C. Whitaker and Joseph Coudon; two-year term, 1922, Edward Hazlett, N. P. Whitaker, Andrew Glass, A. H. Woodward, D. A. Burt and E. C. Ewing; three-year term, 1923, J. M. Clarke, Alexander Glass, William F. Stifel, W. H. Abbott, R. C. Kirk, C. R. Hubbard and J. J. Holloway.

D. A. Burt, secretary La Belle Iron Works, has been elected president of the company, succeeding R. C. Kirk, who resigned, and G. B. Levin of Steubenville, Ohio, has been elected vice-president.

Bulletin 95 of the Bureau of Mines, which is a 753-page glossary of the mining and mineral industry, is now available through the office of the superintendent of documents, Government Printing Office, Washington. Another recent publication of the Bureau of Mines is bulletin 173 on "Manganese: Uses, Preparation, Mining Costs, and the Production of Ferro-Alloys," which has been prepared by C. M. Weld and others and can be secured also through the superintendent of documents.

For the first time in its history, the American Pig Iron Association met in Youngstown, July 21, as the guest of the A. M. Byers Co., Pittsburgh. Following business sessions the members were entertained by Joseph G. Butler, Jr., Youngstown, who is chairman, at the Youngstown Country Club and also visited the Girard plant of the Byers company in Trumbull County. T. W. Friend, of the Clinton Iron & Steel Co., Pittsburgh, is president.

The Federal Sales Corporation has secured the exclusive sales agency in the Pittsburgh district, for the products of the Misener Rotary Hack Saw Co., Syracuse, N. Y.

Bust of Sir Henry Bessemer Installed

A bust of Sir Henry Bessemer, the English inventor who originated the process for making steel known by his name, has been installed in the McKinley Memorial Building at Niles. It was designed by J. Massey Rhind, New York sculptor, who has created busts and representations of a number of the country's industrial leaders. Funds for the Bessemer replica were raised by Joseph G. Butler, Jr., of Youngstown, Ohio, founder of the McKinley Memorial.



BUST OF BESSEMER

Among the busts and other representations which Mr. Rhind has designed are a marble statue of President McKinley, which graces the Court of Honor of the Memorial; bronze busts of David Tod, Civil war governor of Ohio and one of the pioneers in the iron and steel industry of the Mahoning Valley; Cornelius N. Bliss, William R. Day, John Hay, Elihu Root, Philander C. Knox, William H. Taft, Theodore Roosevelt, Marcus A. Hanna, Henry Clay Frick, founder of the library in the McKinley Memorial; B. F. Jones, founder of the Jones & Laughlin Steel Co., Pittsburgh; John R. Thomas, pioneer manufacturer of Niles, Ohio; Andrew Carnegie, Frank H. Buhl, Alexander M. Byers, James Ward, Sr., Henry W. Oliver, C. H. Andrews, Jonathan Warner, Alexander L. Crawford, Robert McCurdy, Charles A. Otis, Col. J. G. Battelle, all pioneers in the iron industry; Elbert H. Gary, chairman board of directors United States Steel Corporation; James A. Farrell, president United States Steel Corporation; George F. Baker, member of the finance committee United States Steel Corporation; James H. Hoyt, eminent orator and lawyer; J. H. Wade, first president Western Union Telegraph Co.; General George A. Garretson and General James Barnett, both Civil War veterans and George Westinghouse, inventor.

Among the early iron manufacturers in the Mahoning Valley memorialized in the institution by bronze tablets designed by Mr. Rhind are Thomas Struthers, James Heaton, Joseph H. Brown, Lucius E. Cochran, Henry B. Perkins, John Stambaugh, James L. Botsford, William B. Pollock and Myron C. Wick.

Mr. Rhind has also designed a bronze tablet of Frank H. Mason, in the United States consular service for 35 years, chiefly in Berlin and Paris, and one of the Home Market Club of Boston, both in the Memorial.

The Jonathan Warner bust is of the grandfather of the present president of the Trumbull Steel Co., who bears the same name.

Upon seeing the bust of himself created by Mr. Rhind, Andrew Carnegie wrote this characteristic note:

"I met with another Andrew Carnegie when I entered the library yesterday. It is an admirable likeness and I cannot find words to express my thanks. He looks like a real good fellow and the original must try harder than ever to live up to the artist's conception. I'll try."

Sir Henry Bessemer's story is familiar to students of the iron and steel industry. He became "convinced that if air could be brought in contact with a sufficiently extensive surface of molten crude iron, the latter would rapidly be converted into malleable iron." As a result of numerous experiments, he created a "converter," which, along with other apparatus, was installed in 1856 in his bronze factory in London and steel ingots were produced which were successfully rolled into rails without hammering. After the process

was developed, after many discouragements, the Bessemer Steel Works in Sheffield was erected, which produced a large output and trained men to carry on similar work in other parts of the world. Growth of the process soon had a widespread effect in cheapening the price of steel and in making it available for railway and other purposes.

Unsatisfactory Conditions in the Coke Region

UNIONTOWN, PA., July 19.—Quotations for furnace coke hit \$18.50 this week, although no deliveries were reported at that figure, which first was attained in Friday's business. Deliveries were made during the week at \$17.50 and \$17.75, ovens. Observers who believed that the peak had been reached earlier in the week through the curtailments at steel plants were surprised at the higher quotations, and now decline to make predictions on the market. In the meantime the car shortage is unabated, reports from the steel mills continue to be pessimistic with plants being forced to suspend or further to curtail production because of transportation troubles.

Coke car placements on the Pennsylvania Railroad this week did not exceed 40 per cent. Placements on the Monongahela division were not over 35 per cent. Several score coal mines and a dozen coke plants along the Redstone and Southwest branches of the Pennsylvania were forced into idleness during the last half of the week because of car shortage.

Coal reached a new high price level during the week with quotations of from \$11.25 to \$11.75, a few sales having been made at \$12.

Swedish Pig Iron Output Low in First Quarter

WASHINGTON, July 20.—Figures relative to the production of iron in Sweden forwarded by Consul General D. I. Murphy from Stockholm show that production from Jan. 1 to March 31 of this year largely decreased compared with the corresponding quarter of last year. The falling off amounted to not less than 203,400 tons, and was due to the lockout in the iron industry enforced against the workers because of their unreasonable demands. Now that the production has been resumed it is certain that the output will be largely increased during the remainder of the year.

Total iron and steel production for the first quarter of 1920 amounted to 199,100 metric tons, as against 402,500 metric tons in the same period of 1919.

A Virginia-Kentucky Coal Co.

The Virginia Coal & Coke Corporation was chartered in Virginia on July 3, 1920. The authorized capital stock is a maximum of 100,000 shares and a minimum of 50,000 shares of no par value stock. The purpose of the organization is to acquire, develop and operate coal lands in Virginia and Kentucky. The principal office is in Roanoke, Va. John B. Newton is president, D. D. Hull, Jr., vice-president, and J. W. Cure, secretary and treasurer, all of Roanoke. In addition to Messrs. Newton and Hull the directors are James B. Mabon, Alexander V. Roe, and Theodore Peters, all of New York. The officers are identical with those of the Virginia Iron, Coal & Coke Co.

The Midwest Engine Co., Indianapolis, has shipped two 2800-hp. Midwest-Parsons steam turbines to the Asano Ship Building Co., Yokohama, Japan, each unit consisting of a low and high pressure turbine, weighing, with gear and piping, 31,780 lb. They are similar to 41 sets manufactured by the company for the Emergency Fleet Corporation.

A self-reading micrometer marketed under the trade name Simplex has been placed on the market by the Consolidated Tool Works, 261 Broadway, New York. It is made for both the English and Metric systems and is guaranteed not to vary in its reading more than one-tenth-thousandth part of an inch.

NEW LACKAWANNA OFFICERS

George F. Downs Becomes President and Other Promotions Result

The election of George F. Downs as president, Thomas H. Mathias as vice-president and general manager and of Henry H. Barbour and Arthur J. Singer as vice-presidents has been announced by the Lackawanna Steel Co. in the past week. Mr. Downs succeeds the late Charles H. McCullough, Jr.; Mr. Mathias succeeds Mr. Downs as vice-president and general manager, and Mr. Barbour succeeds Charles R. Robinson, who recently resigned the office of vice-president in charge of sales. Mr. Singer, who for a number of years has been assistant to the president, becomes vice-president at the New York office. President Downs, General Manager Mathias and Vice-President Barbour will have their offices at Buffalo.

George W. Whitehead, who has been assistant general superintendent, has been made general superintendent, succeeding Thomas H. Mathias. Harry J. Kelly, heretofore assistant superintendent, has been promoted to assistant general superintendent, succeeding Mr. Whitehead, and Randolph Payson has been appointed assistant superintendent.

As with E. A. S. Clarke and Mr. McCullough, his predecessors in the presidency, Mr. Downs's early experience in steel works operation was obtained at the South works of the Illinois Steel Co. He went from South Chicago to Buffalo in 1905 to become assistant superintendent of the Lackawanna plant. He was made general superintendent in 1909 and when Mr. McCullough became president he followed the latter as vice-president and general manager.

Mr. Mathias was born in Hamilton, Ont., May 24, 1869, and was educated in the public schools of Rosedale, Kan., and Chicago. In 1886 he became an apprentice at the South Chicago works of the North Chicago Rolling Mill Co., which was later taken over by the Illinois Steel Co. Five years later he was placed in charge of roll designing and roll turning in these works, resigning in 1905 to take a similar position with the Lackawanna Steel Co. Four years later he was made assistant general superintendent of the Lackawanna Steel Co. In January, 1919, he was made general superintendent, which position he held when he received the last promotion. He belongs to a family of steel men, his father, D. S. Mathias, who died in 1917, having been consulting superintendent of the South works of the Illinois Steel Co.; his brother, D. R. Mathias, being general superintendent of the Joliet works; and another brother, W. G. Mathias, assistant general superintendent of the Tennessee Coal, Iron & Railroad Co., Ensley, Ala. T. H. Mathias developed at the Buffalo works a method of eliminating seams in steel rails. It was described by Robert W. Hunt in a paper published in THE IRON AGE of Dec. 10, 1914. Mr. Mathias contributed a notable paper to the American Iron and Steel Institute in 1913 on "Progress in Steel Mill Roll Design."

Henry H. Barbour resumes connection with the Lackawanna Steel Co. after having been since Jan. 1, 1919, vice-president of the Consolidated Steel Corporation, New York, which carries on the export business of various independent steel companies. He graduated as civil engineer from the University of Illinois, and his connection with the steel trade dates from 1893 when he entered the sales department of the Carnegie Steel Co. at Chicago. He continued in this position until 1901 when he went to New York to take charge of the steel department of the George

A. Fuller Co. In 1904 he went with the sales department of the Lackawanna Steel Co. in New York and in 1911 was made the New York district sales manager of the company. From September, 1917, up to the armistice he was a member of the Priorities Committee of the War Industries Board at Washington and rendered conspicuous service in the important work of that committee.

Mr. Singer started with the Illinois Steel Co. as credit manager. Later he became treasurer of the Guardian Trust Co., Chicago, but was recalled by the Illinois Steel Co. to resume his former position. He went to New York in 1902 as a partner in the firm of Harris, Gates & Co., headed by John W. Gates. When the firm went out of business in 1907 he became connected with the New York office of the Lackawanna company as assistant to the president, E. A. S. Clarke, in charge of finance, credit and collections.

Mr. Whitehead went to the Lackawanna company from the Illinois Steel Co. with Mr. Downs in 1905. Mr. Kelly has been with the Lackawanna organization for 30 years.

Opposed to Compulsory Adoption of the Metric System

The committee on industrial developments of the Cleveland Chamber of Commerce has just prepared an able report in opposition to the compulsory adoption of the metric system. The report shows that the committee made a thorough study of the subject. Among the members of the committee signing the report are J. C. Brainard, sales manager Johnston & Jennings Co.; Edward L. Cheyney, manager Aluminum Co. of America; H. F. Deverell, secretary Otis Steel Co.; Thomas Ferry, president Ferry Cap & Set Screw Co., and G. E. Merryweather, president Motch & Merryweather Machinery Co.

Compulsory laws in favor of the metric system will be a fatal mistake, declares Dr. Alexander C. Humphreys, president of the Stevens Institute of Technology, in a letter made public a few days ago. He says that such laws would place upon the industrial interests of the United States a tremendously heavy and unnecessary burden which would at this time, in view of foreign competition, be particularly inexpedient.

Export of Pig Iron Prohibited

WASHINGTON, July 20.—A cablegram from Commercial Attache W. C. Huntington, Paris, to the Bureau of Foreign and Domestic Commerce, under date of July 12, states that a French decree of July 4, published in the *Journal Officiel* for July 10, prohibits the exportation of foundry pig and forge pig containing less than 15 per cent of manganese, and spiegel-eisen, containing from 15 to 25 per cent of manganese, and waste and scrap iron which can be utilized only for resmelting, except under special license. The decree went into effect immediately upon publication.

Receiver for Hess Steel Corporation

The Baltimore Trust Co. and C. C. Pusey, Baltimore, have been appointed by consent receivers for the Hess Steel Corporation, Baltimore, concern. Bond was fixed by the court at \$100,000. Application for receivership was made by Harry T. Murray and Jacob S. Shapiro, trading as the United Iron & Metal Co., charging that the corporation could not pay its debts as they matured. The Hess Steel Corporation was incorporated on Nov. 3, 1915. Henry Hess is president. It has a rated capacity of 10,000 tons of ingots and 10,000 tons of rolled products.



T. H. MATHIAS



H. H. BARBOUR

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Better Railroad Service Now

If a railroad car costs three times as much as it did before the war, it is good business to spend three times as much money getting service out of the car. The best freight car movement shown for a year was in 1916, an average of 26.9 miles a day. Last year the average was 23.1 miles. No later statistics have been presented. As there are about 2,300,000 freight cars, a variation of a mile a day from the 1919 average is equivalent to 100,000 freight cars. Computing precisely, at the 1919 rate of travel, 380,000 more cars would be required to perform the same service than if the cars moved at the 1916 rate. For the average of the past three months an estimate of 20 miles would be high, and at that rate of travel it would require 3,200,000 cars to perform the same service as 2,300,000 cars at 26.9 miles a day, or 900,000 cars more.

Mr. Willard is certainly competent to speak, being president of the Baltimore & Ohio and chairman of the advisory committee of executive officers which on July 1 started to deal with the Interstate Commerce Commission and exercise general supervision over the handling of equipment and the movement of traffic. In a comprehensive and intelligent statement before the commission on July 8 Mr. Willard said: "I believe it should be and really is possible to obtain an average movement of 30 miles per day under normal circumstances." He also argued for heavier loading than the average of 70 per cent of capacity lately shown, and for greater loaded movement than the present 68 per cent.

Surely it has been made clear that the railroad problem, which has reached the crisis stage, is not only simply involving hastily constructed additional cars and locomotives. Enlarged terminals and additional block signalling will help, but such matters involve years of construction. The country cannot wait, nor is it disposed to wait. The immediate problem is clear-cut, that of securing greater efficiency in the use of the railroad plant now existing. The plant itself cannot be changed measurably in a few months or in a year.

The service secured from the plant can be improved as quickly as means can be found and applied for doing so.

It is generally accepted that for a period of years there must be great expansion in the physical facilities of the railroads. New cars are needed, not so much to increase the total number, for many cars now are simply cluttering the tracks, as to replace cars that are not fit to render the requisite service, when track space is so valuable. Locomotives are needed, both to increase the total number and to replace unfit engines. More track signaling is required, more second track, more yard and terminal facilities. This involves a work of years and is not the immediate problem, which is one of improving the performance of the existing facilities, by improvements in methods, by the rendering of better service by every one connected with the railroads, from the highest official down to the common laborer, and by greater co-operation on the part of the shipping public.

No one should delude himself by thinking that the test of American railroading is guaranteed to last for the whole period necessary for the making of the physical improvements that are needed. If the traffic situation is not speedily improved, within a period of months, the issue of government ownership and operation will be presented again, and he is a resourceful and ingenious man indeed who can outline how it will be possible to meet propaganda along that line.

There can be no doubt whatever that the shippers as a body do not desire a change from private to public ownership and operation. They recognize clearly that the present difficulties, involving both methods of conducting transportation and the spirit in which men engaged in the business of transportation render their service, would be greatly aggravated in any system of government operation. It would be "out of the frying pan into the fire"; but the practical question is one of preventing the issue from coming up, and this can be done only by the railroads making a better showing in the next few months with the physical facilities they have.

In such a crisis there is no excuse for modesty

on the part of the shippers who can give helpful suggestions. Their duty to themselves and the public is to speak out.

Suppression of Agitators

The decision by Judge R. M. Kennedy in the county court of Pittsburgh, sustaining the conviction of six organizers and speakers of the American Federation of Labor for violating an ordinance of the city of Duquesne which prohibits public speaking without the permission of the city officials, is in harmony with the decisions of higher courts, although the Duquesne ordinance differed in some respects from other ordinances which have stood the test. These other ordinances prohibit parades and assemblages where they interfere with or deprive other citizens of their legal rights. But in this latest case, the rights of the public are protected even if in a physical way no one is crowded off the streets or out of public halls.

Judge Kennedy pointed out that the avowed intention of the meeting which resulted in the arrest was to discuss publicly a subject in a locality where in the past its discussion had been the cause of riots, bloodshed and death, and a subject which at this time provokes great excitement, bitter feeling and inflamed passions among those who discuss it. Local conditions in Duquesne at the time were such as to cause fear of serious consequences. They were very much like those which prevailed a year ago at McKeesport, where in the interest of peace and safety, the mayor forbade all meetings, including those of a strictly political nature.

In the suppression of public speech, it is necessary to have the utmost forbearance for those who honestly entertain radical opinions. If for no other reason than that suppression often does more harm than good, the best judgment is needed in deciding these questions. But it is well that city and state officials and courts entrust mayors and other officials with power to suppress any meetings and other means of agitation which are almost certain to result in bloodshed. The Pittsburgh decision ought to have a wholesome influence. The policy of American municipalities in respect to free speech has always been one of extreme lenience. Whatever measures have been taken, as in the cases cited above, have been not so much suppression of so-called radical opinions as the prevention of outbursts of passion when such outbursts were calculated to result in bloodshed.

Training to Read and to Write

The North East Coast Institute, a British association having chiefly to do with shipbuilding, has undertaken to give the young men in that industry a better knowledge of the engineering literature in their respective lines of work, and at the same time to stimulate them to analyze what they read and to put into writing the results. The plan is suggestive to American industrial works in which organized effort is made to improve the quality of the personnel by means of educational courses. To give a young man an

acquaintance with the books and other publications pertaining to his life work, and at the same time increase his proficiency in writing the English language, will appeal to many as much worth while in industrial education.

Under the British plan prizes are offered for what are termed the best bibliographical papers. These are to contain short reviews of the works read, giving an epitome of the contents and such comments as the author of the paper may see fit to make, also a short review of the state of development of the engineering subject dealt with. The literature prescribed includes in addition to standard treatises and textbooks, the proceedings of scientific and technical institutions and articles in the engineering press, including American publications.

Not enough of this sort of work has been demanded from the students of engineering schools in this country and abroad, simply because the crowded courses do not permit of it. In industry, the young men chosen for the company training schools do some reading on subjects relating to their professional or vocational work, but the effort in this direction is seldom systematic. Many of them, otherwise splendidly equipped in mind and body, do not know how to go about increasing their knowledge by the use of technical literature. They do not realize the means of improvement available for them on the shelves and the reading tables of the public libraries. They are not induced to gather together small libraries of their own. Unfortunately this is true of too many graduates of the important engineering schools, and of very many more of those whose technical education has ended in schools of a more elementary scope.

There are great possibilities, also, in the North East Coast Institute's requirement as to written work. A large proportion of the young men in industry are deficient in ability to express themselves in writing. The heads of engineering schools complain that most of their students are insufficiently grounded in English by preliminary education and as there is insufficient time for it in an engineering course many graduate unable to use the English language with clearness and accuracy.

British and American Post-War Prices

The course of prices in the British and American iron and steel markets after the removal of government control presents some contrasts as well as parallels. According to data from a British source, prices of British pig iron in April of this year were about 100 per cent higher than in April, 1919, when control was removed, and about 300 to 325 per cent higher than in April, 1914. Taking as two representative American irons, basic and foundry No. 2, the increase from April, 1919, to April, 1920, has been 75 and 50 per cent respectively, whereas compared with April, 1914, the appreciation in values has been about 350 and 300 per cent respectively.

In finished and semi-finished steel, the situation is considerably different. Last April American steel rails were 20 per cent higher than in April, 1919, and 200 per cent higher than in April,

1914. But British steel rails last April were 69 per cent higher than one year previous and 283 per cent above the 1914 price. In beams and structural material the American price last April was only 25 per cent in advance of that in April, 1919, but is was 275 per cent higher than in April, 1914. British steel plates last April were selling 65 per cent higher than in the April previous and 240 per cent higher than in April, 1914. The appreciation in American plates has been 30 per cent and 300 per cent respectively.

The most pronounced advances in British post-war prices have been in billets and sheet bars. In April, 1920, billets were selling 415 per cent higher than in April, 1914, and 100 per cent higher than in April, 1919, while sheet bars had advanced last April 590 per cent over the pre-war price and 150 per cent over that of 12 months previous. In the United States billets were selling last April 300 per cent higher than in April, 1914, but only 35 per cent in advance of the price a year ago. The advance in American sheet bars has been less than half that of the British product. The price last April was only 275 per cent higher than

six years previous and only 50 per cent higher than one year ago. In general American advances in the last year have ranged only from 20 to 50 per cent while the British have increased 65 to 150 per cent. Contrasted with April, 1914, or six years ago, the American range of price advance has been from 200 to 300 per cent while the British variation has been from 240 per cent in beams to 590 per cent in sheet bars.

It should be said that in this comparison the American independent 'companies' prices have been taken instead of those of the Steel Corporation. Had the latter been used the percentage of increase in American prices in most cases would have been much less. While labor and industrial troubles have been a large factor in the British advances, they have also been important influences in domestic markets. The more favorable showing in American prices, or the fact that the extreme appreciation in values has been less than in Great Britain, is due largely to the stabilizing influence of the leading interest which without doubt has prevented even higher prices and a runaway market.

STRIKE NOT EXPECTED

Railroad Employees Will Probably Accept Award — Analysis of New Schedules

CHICAGO, July 20.—The award of the United States Railroad Labor Board, affecting 1,894,000 railroad employees, was announced in Chicago to-day. The wage increases granted will total about \$600,000,000 annually as against demands exceeding \$1,000,000,000.

Expressions from leaders of the brotherhoods in session in this city to consider the award indicate dissatisfaction with the advances authorized, but do not show that any concerted course of action by the unions has been decided upon. In fact, one union official stated that an immediate strike is improbable, as it would take place while the railroads are under Government protection, and would therefore be more to the liking of the carriers than a walkout subsequent to Sept. 1. While the average increase is about 25 per cent as against demands for a 60 per cent advance, an examination of individual wage schedules shows that in some cases the award did not fall very far short of what was asked. The Brotherhood of Railroad Trainmen asked that passenger brakemen be increased from \$120 for a 30-day month, to \$150 for a 26-day month. The award provides for an advance to \$150, but does not reduce the monthly basis to 26 days on the grounds that time did not permit thorough consideration of rules, working conditions and agreements in effect, and that modification can be made only after further hearings which will be held at the earliest possible date. The same union demanded that baggagemen be advanced from \$124.80 for a 30-day month to \$160 for a 26-day month. The award provided for a straight increase of \$30 per month. For yard foremen \$7.20 was asked and \$6.96 granted. For yard helpers \$6.90 was demanded and \$6.48 granted. Switch tenders were advanced to \$5.04, whereas \$5.90 was asked.

Conductors' Demands

The Order of Railway Conductors demanded that passenger conductors be increased from \$180 per month to \$225 for a 26-day month. A straight advance of \$30 per month was authorized. For through freight conductors increases of from \$2.25 to \$2.56 were asked, and a straight advance of \$1.04 was granted. Local

freight conductors wanted increases of from \$2.46 to \$2.87, and were given an increase of \$1.04.

The Brotherhood of Locomotive Firemen and Enginemen demanded an increase of \$1.84 for road freight firemen as against the award of \$1.04. They asked an advance of \$2.25 for yard freight firemen and \$1.44 was granted.

For passenger firemen they asked an increase of \$2.19 and 80 cents was authorized.

The Brotherhood of Locomotive Engineers made no specific demands, but asked for increases proportionate to those granted other employees.

Overtime Not Granted

All of these organizations asked for time and time and one-half for all Sunday and holiday service, and a guaranty of 26 days a month for regular employees in all classes of service. This demand was not granted, but will be considered in subsequent deliberations of the board. All of the road employees, as distinguished from yard employees in the four foregoing organizations, now get proportionately increased daily pay when they make mileage in excess of 100 miles and in freight service get time and one-half for time consumed in excess of what would be required on the guaranteed speed basis, which is two and one-half miles an hour.

Some of the other crafts received advances closely approximating what they asked. Mechanics in the maintenance of way department wanted an advance of 15c. an hour and got it.

Signal employees wanted an increase of 10c. and were granted an advance of 13c. for all employees except signal helpers, who were given 10c.

The shopmen asked for advances of from 13c. to 18c. an hour, and were granted 13c. The telegraphers asked that the rates received on the Southern Pacific—Pacific System—be taken as a basis and that a 17c. an hour advance be added. They were granted a straight advance of 10c.

The award of the board is retroactive to May 1, 1920. In case of any dispute arising between management and employees as to the meaning or intent of the award, which cannot be decided by the parties concerned, the labor board stands ready to adjust the difficulty as provided in the transportation act of 1920.

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PERSONAL

Included in the board of directors of the new Midland Bank, recently organized in Cleveland, are H. M. Hanna, Jr., M. A. Hanna & Co.; A. W. Henn, president National Acme Co.; H. C. Osborne, president American Multigraph Co.; Hugh Wick, president Elyria Iron & Steel Co.; Christian Zimmerman, treasurer W. S. Tyler Co., and R. E. Bebb, president Central Steel Co., Massillon.

Austin H. Campbell, Monarch Machinery Co. Philadelphia, is on an extended tour of the Canadian Rockies and Pacific Coast. He is accompanied by his family and is expected to return the early part of September.

A. C. Cook, general sales manager Warner-Swasey Co., Cleveland, accompanied by Mrs. Cook, is making an extended trip in New England.

Edward W. Harry, electrical engineer, left the electrical department of the National Tube Co., McKeesport, Pa., July 17, to accept the position of chief electrical engineer with the Pittsburgh Steel Co., Monessen, Pa.

E. F. Vogel has been appointed superintendent of the by-product coke oven department of the Youngstown Sheet & Tube Co., succeeding L. H. Underwood, who has become associated with the American Tar Products Co. as vice-president.

Joseph T. Somers, sales manager Wyckoff Drawn Steel Co., Pittsburgh, recently was elected vice-president and a director of that company. Mr. Somers, who has been in charge of sales for the company since its organization, almost two years ago, will continue to serve in that capacity.

Lawrence Dunn, superintendent at the plant of the International High Speed Steel Co., Rockaway, N. J., has resigned.

E. A. Munson has resigned as chief clerk of the traffic department of the Youngstown Sheet & Tube Co. to become associated with the American Tar Products Co. at the Youngstown office. He will later be transferred to Chicago.

The Combustion Engineering Corporation announces the appointment of Henry Kreisinger, formerly of the United Bureau of Mines, as engineer of research. He compiled a large proportion of the Government pamphlets on fuel and combustion problems. Mr. Kreisinger will conduct investigations for the Combustion Engineering Corporation of a similar nature to those that he conducted for the Government; and the results of his work will not only be available to the clients of that corporation, but will also be supplied to the Government.

Harry A. Raseley has resigned as sales manager C. E. Johansson, Inc., Poughkeepsie, N. Y., to become export sales manager for the Nordyke Marmon Co. on August 1. He formerly represented the General Motors Corporation in the export field. Lawrence G. Spealman, who has been the Johansson representative in Michigan for the past year and a half, goes to Poughkeepsie as sales manager. The Michigan territory is to be taken over by John K. Murray, a member of the sales organization in Poughkeepsie, who will have his headquarters in Detroit.

Col. E. A. Deeds, General Motors Corporation, Dayton, Ohio, Gordon Rentschler, Hooven, Owens, Rentschler Co., Hamilton, Ohio, and W. B. Mayer, Ford Motor Co., Detroit, left last week on a trip to Europe. It is understood that the visit of these gentlemen is in connection with the oil problem. They will be gone about two months, and will visit England, France, Italy and Germany.

Dr. Mario Diaz Irizar, director of the International Trade Mark Registration Bureau at Havana, has arrived in Washington to confer with officials of the

State Department, Patent Office, and other Governmental agencies concerning the work of the bureau.

James A. Murphy, for the past 15 years superintendent of the foundry department of the Hooven, Owens, Rentschler Co., Hamilton, Ohio, has resigned.

R. A. Byrns, R. A. Byrns & Co., 120 Liberty Street, New York, representatives of the Northern Engineering Co. and the Towmotor Co., has sailed for England and France on a short business and pleasure trip. Mr. Byrns was formerly a lieutenant of infantry in the American Expeditionary Forces.

William Harris has been elected president of the Fortune Tool & Mfg. Co., Wooster, Ohio, succeeding F. R. Fortune, and has resigned as president of the Citizens' National Bank, Wooster, to devote his time to his company.

The R. & J. Dick Co., Inc., is opening a branch in San Francisco for the sale of the Dick belts and general transmission equipment. Edward M. Wolf, who established the Seattle branch several years ago, will have charge of the branch, his territory consisting of California and Nevada.

Thomas S. Green, until recently with the sales force of the Norton Co., Worcester, Mass., has sailed for France, where he is to act as resident manager of a property recently acquired by his company.

H. C. White has resigned as factory manager of the Harris Mfg. Co., Stockton, Cal., effective Aug. 1, to devote full time to the H. C. White Foundry Co., same city, in the capacity of president and general manager.

Thomas H. G. Peirce, who recently resigned as master mechanic of the Eaton, Crane & Pike Co., Pittsfield, Mass., is to be factory manager of the Erie Bolt & Nut Co., Erie, Pa.

Robert E. Cligan, sales manager Bock Bearing plant, Toledo, Ohio, of the Standard Parts Co., has been made general manager of that plant, succeeding George H. Kleinert, who has retired.

Harry W. Goddard, Worcester, Mass., president and treasurer Spencer Wire Co., is on his way to Alaska, where he will spend three months inspecting mining properties near Mt. McKinley.

W. S. Quigley, president Quigley Furnace Specialties Co., New York, sailed for France on the Imperator on July 15 to further the business relations of the Quigley organization in England, France, Belgium, Italy and Spain.

Claude Johnson, managing director Rolls-Royce Co., England, who has been in this country for the past three weeks in connection with starting operations at the American branch, Springfield, Mass., sailed from New York last week on the Imperator for England.

Philip B. Kennedy, formerly chief of the Bureau of Foreign and Domestic Commerce at Washington, is now vice-president of the First Federal Foreign Banking Association, 40 Wall Street, New York. The new bank has been established for handling export and import credits on the broad lines provided for in the Edge act.

Howard C. Adams, formerly chief estimator for Tate-Jones & Co., Inc., has joined the George J. Hagan Co., Pittsburgh, as engineer in the liquid fuel department.

S. S. Freeman has resigned as receiver for the Temple furnace of the Seaboard Steel & Manganese Corporation, Temple, Pa. The resignation has been accepted by the United States Federal Court for the eastern district of Pennsylvania. Mr. Freeman's resignation was due to ill health, and in accordance with his personal request, W. L. Wolfe, superintendent of the furnace for the past eight months, was appointed receiver by the court and will continue the operation of the plant until some disposition is made of the property by the court. Mr. Freeman will continue in his position as secretary-treasurer of the Port Henry Iron Ore Co., 2 Rector Street, New York.

H. A. Brassert, chairman Freyn, Brassert & Co., engineers, Peoples Gas Building, Chicago, sailed for

Europe on the Imperator, July 15. Mr. Brassert is going to England, Holland, Belgium, France and Germany in connection with certain contracts and to look after the company's interests in these countries. Mr. Brassert is expected to return the latter part of September or early in October.

Frank J. Farrell has been appointed Eastern representative for the Precision & Thread Grinder Mfg. Co., Philadelphia, manufacturer of the Multi-Graduated precision grinder.

The Wickwire-Spencer Steel Corporation, Worcester, Mass., announces the following additional appointments: Assistants to the president, L. L. Arnold, H. J. Woodmansee, Buffalo; assistant general sales managers, John A. Denholm and Charles F. Hardy, Jr., Worcester, Mass.; sales manager, in charge of the New York office, Raymond Jay Southwell, New York; general service engineer, Winthrop G. Hall, Worcester; chief engineer, Gustav A. Merkt, Worcester; advertising manager, John W. Odlin, Worcester; assistant secretary, Charles C. McDonald, Buffalo; general traffic manager, Harry H. Marsales, Buffalo; district traffic manager, Joseph S. Sampson, Worcester.

Alfred M. Staehle, formerly editor of the *Blast Furnace and Steel Plant*, has assumed his new duties in the industrial section of the department of publicity of the Westinghouse Electric & Mfg. Co., Pittsburgh.

Charles Jewett Parsons has been recently added to the sales staff of the Celite Products Co., manufacturer of Sil-O-Cel heat insulating products. Mr. Parsons is a specialist in power plant work and is a graduate of the Massachusetts Institute of Technology. He will be connected with the New York office.

Hooper C. Dunbar, formerly manager iron and steel products department, Monroe, Leon & Tees, Inc., 311 California Street, San Francisco, has left that company to go into business for himself as an import and export broker with office at 310 Sansome Street, San Francisco.

The Italian government has nominated Elbert H. Gary, chairman, United States Steel Corporation, for Grand Officer of the Crown of Italy; William Wooden, president American Car & Foundry Co., for Commendatore of the Crown of Italy; E. P. Thomas, president United States Steel Products Co., Cavaliere Ufficiale of the Crown of Italy.

Thomas P. Orchard has resigned as secretary and sales manager of the Service Engineering Co., Inc., to accept an appointment as director of sales with the Arthur Knapp Engineering Corporation, New York and Detroit. The company is engaged in the design and manufacture of machinery, tools and equipment for quantity production and interchangeable manufacture.

J. Leonard Replogle, president Vanadium Corporation of America, according to a Paris cable, has been elected a director of the Berg und Huette corporation in Teschen, formerly in Austria and now in Czechoslovakia. Control of the company is held by the Schneider interests in France.

M. J. O'Loughlin of the staff of Perin & Marshall, New York, recently returned from an extended trip to China.

Arthur J. Eddy, the well known attorney, whose plan of co-operation is in use by a number of associations of manufacturers, is in a New York hospital recovering from an operation for appendicitis.

OBITUARY

JEREMIAH E. REEVES, Dover, Ohio, died at his home in that city on July 11. Mr. Reeves was the principal owner of the Greer Steel Co. of Dover, and of the Toledo, Findley & Fostoria Traction Co. He was a native of England and at the time of his death was 79 years old.

GERMANY BUYS PIG IRON

High Manganese Foundry Iron in Demand— Railroad Tieups Still the Greatest Obstacle to Export

European buyers continue to purchase actively in the United States, evidently under the impression that the exchange rates of their respective countries once having started, the upward climb will shortly reach some figure near par, and that by the time obligations incurred now become due, the cost will be even more favorable. Under present conditions of railroad transportation, however, sellers are not as anxious for this business as they would be otherwise. One exporter, pointing out the difficulties in making shipments, says that in shipping Southern foundry iron to Hamburg, Frankfort and Rotterdam, under contracts, in numerous instances the cars are so delayed as to miss the ship to which they are consigned and he is forced to pay demurrage charges at the port. Exporters complain particularly of shipments from mills west of Pittsburgh.

There is a good demand from Germany for high-manganese foundry iron, one exporter reporting three fairly large inquiries within a week from Hamburg and Frankfort, to which he has made previous shipments via Rotterdam, Holland. Sweden and England are also buying foundry iron, and the former inquires from time to time for small quantities of coke in spite of the high prices. A recent inquiry for 1200 tons of ship plates for export to England received bids from one mill of 3.40c., f.o.b. Pittsburgh, and from another of 3.50c., f.o.b. Pittsburgh. An exporter who did a good business with European markets in spiegeleisen before the price advanced reports a recent sale, the first in several months, of 150 tons to France.

The Japanese situation is practically unchanged, but most exporters are looking forward to some buying in that market in a few months. The recent embargo placed on importations of Japanese material by the Government of the Dutch East Indies, in order to protect local merchants from "dumping," has not aided the Japanese in reducing the congestion of material; but there is a feeling that Japan has no more iron and steel than can be absorbed within the country and that when the congestion at the ports is relieved, buying will be resumed, though it is realized that time must be a factor in Japanese financial and industrial recovery. In the effort to drop everything regardless of price, there have been many instances of cancellations of material purchased at low prices, which reacted to the benefit of the exporter. One large export concern has received cancellations on between 60,000 and 70,000 boxes of tin plate, purchased for export at \$7 and \$7.50 per base box.

As the tin plate was not bought c.i.f. Japan, the company has resold it to other markets at a better price than was originally quoted to the Japanese buyer.

Many exporters are advising careful buying, to avoid losses by cancellation in case of a softening in prices of any material. There is a little more optimism in some quarters on the possibility of improvement in the railroad situation, and port shipments at New York are better.

Structural Work Falls Off in June

Reports collected by the secretary of the Bridge Builders' Society, New York, show that during the month of June 90,400 tons of fabricated structural steel was contracted for throughout the country, or the equivalent of about 50 per cent of the entire capacity of the bridge and structural shops. In the first six months of the year the total tonnage contracted for was 779,200, which represents about 72 per cent of capacity. The high month was February, 171,123 tons, representing 95 per cent of the capacity. In March the percentage was 83.5, in April 68, in May 61.5. Thus there has been a steady decline since February.

Iron and Steel Markets

DIFFICULTIES SERIOUS

Railroad Wage Advance May Help, But Only Slowly

Reactions in Other Industries—Construction Halted—Plates for Germany

Appraisal of the effect of the 21 per cent advance in railroad wages is not easy in the absence of clear indications of the attitude of the unions. In the steel trade the more general opinion is that with the award retroactive for ten weeks and in view of its amount a widespread strike against it is not likely. The increasing signs of reaction in various industries are cited as having an important bearing.

Steel manufacturers look for some relief from the desperate conditions of many weeks, with the return to work of experienced railroad workers, but it is recognized that improvement will be slow and it is admitted that the accumulations of product are more than have been commonly known.

Seeing that manufacturing consumers are still crowding for material, the question of the absorption of the expected freight rate advance of 18 per cent or more is not a live issue in the steel trade. It represents in some districts about \$3 on a ton of steel and on business already under contract would fall on the consumer. Whether the recent tendency of the higher prices of independent producers to approach those of the Steel Corporation will be more marked as new business is entered will depend on the extent of the slowing down in other industries.

The continuance of \$46 basic pig iron and \$18 coke are proof of the constriction in the raw material end of the industry, which is matched in higher sheet prices at the other end, in spite of the easing off in the automobile trade, and in a more acute scarcity of tin plates and of iron and steel pipe. While the Steel Corporation has only 60 per cent of its tin plate capacity in operation, independent makers are doing better, the average for the entire industry being put at 75 per cent.

Many canning plants are on the verge of closing down because of non-shipment of tin plate to the makers of cans. Shut-downs of plants on the coast of Maine for two to three weeks mean idleness for 10,000 workers.

Structural work is falling off sharply. June reports show 90,400 tons booked by fabricators or 50 per cent of the capacity of the country. For the half year the total was 779,200 tons, or 72 per cent of possible output. There has been a steady decline since February, when orders placed were 95 per cent of capacity.

Industrial extensions, in the absence of bridge work and new apartments and office buildings, have been the backbone of the fabricating industry, but now the outlook in all construction lines is unfavorable.

Heavy cancellations of ships continue to figure in British steel market reports and the unfavorable influence on the shipbuilding industry in the United States is recognized. Buying of American plates

for British shipyards may be expected to shrink. However, surprising as it may seem, negotiations are under way for the purchase of plates in this country for a German shipyard, the conversion of mark credits into dollar credits having a fair prospect of going through.

Increasing interest in the pig iron market for the first half of next year is shown in the Central West and the East, but both furnaces and melters are cautious. The Buffalo company which recently sold 4000 tons at \$45 for that delivery has declined to book more and another Buffalo company is asking \$46, with no sales reported. The Virginia company which last week entered the market at \$46 for first half sold a very small amount, and eastern Pennsylvania furnaces which named that figure have made few if any sales. On the whole, the market for the first six months of 1921 is far from being determined. In the Pittsburgh district the scarcity of basic is pronounced and iron of this grade may be brought from Alabama furnaces, from which it can be delivered in Pittsburgh at \$47.70, or only 30 cents more than the prevailing price in that district for Northern basic. The Philadelphia market on basic is higher. An interesting feature of the recent troublous times has been the comparative comfort of operation of Southern stacks owing to the proximity of ore and coke, but these producers will be hampered in competition in Northern districts after the expected freight advances become effective.

Manganese ore from the Caucasus has been offered in this country for the first time in six years; however, at 80 cents per unit, Atlantic seaboard, it is high priced, Indian manganese ore being available at 70 to 75 cents.

Pittsburgh

PITTSBURGH, July 20.

The iron and steel industry in the central region, which embraces Cleveland, Youngstown, Wheeling, Johnstown and Pittsburgh, still is feeling the acute shortage of railroad cars as well as the fact that railroad operations remain sub-normal in point of efficiency. While the leading independent steel maker in the Pittsburgh district reports that in the past month shipments have about balanced production and that the accumulated stocks are no greater now than they were a month ago, such statements are the exception rather than the rule, and even this company has close to 150,000 tons of steel awaiting shipment. Some disposition is observed on the part of the different steel companies to withhold the actual figures of piled up stocks and the reason probably is to be found in the fact that accumulations are even greater than are popularly supposed. One estimate, unofficial but from a reliable source, credits the corporation with having 250,000 tons of semi-finished steel at its plants in the central district. It is estimated that fully 2,000,000 tons of steel in various forms is piled up at all plants, including those in the Chicago district and in the East, and that fully 75 per cent of this tonnage is held within the area bounded by Cleveland, Wheeling, Pittsburgh, Johnstown and Buffalo.

Announcement of the award of the Railway Labor Board as bearing on the railroad situation is received with mixed emotions by the iron and steel industry.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics
At date, one week, one month, and one year previous

For Early Delivery

| Pig Iron, Per Gross Ton: | July 20, 1920 | July 13, 1920 | June 22, 1920 | July 22, 1919 |
|----------------------------|------------------|------------------|------------------|------------------|
| No. 2 X, Philadelphia... | \$48.15 | \$48.15 | \$47.15 | \$29.10 |
| No. 2, Valley furnace... | 45.00 | 45.00 | 45.00 | 26.75 |
| No. 2 Southern, Cin'tt... | 45.60 | 45.60 | 45.60 | 28.35 |
| No. 2, Birmingham, Ala.† | 42.00 | 42.00 | 42.00 | 26.75 |
| No. 2, furnace, Chicago* | 45.00 | 45.00 | 43.00 | 26.75 |
| Basic, del'd, East Penn... | 44.40 | 43.00 | 44.80 | 26.00 |
| Basic, Valley furnace... | 46.00 | 46.00 | 44.00 | 25.75 |
| Bessemer, Pittsburgh... | 47.40 | 47.40 | 44.40 | 29.35 |
| Malleable, Chicago* | 43.50 | 43.50 | 43.50 | 27.25 |
| Malleable, Valley... | 45.00 | 45.00 | 44.00 | 27.25 |
| Gray forge, Pittsburgh... | 44.40 | 44.40 | 44.40 | 27.15 |
| U. S. charcoal, Chicago... | 57.50 | 57.50 | 57.50 | 31.75 |

Rails, Billets, Etc., Per Gross Ton:

| | | | | |
|------------------------------|------------------|---------|---------|---------|
| Bess. rails, heavy, at mill | \$55.00 | \$55.00 | \$55.00 | \$45.00 |
| O-h. rails, heavy, at mill | 57.00 | 57.00 | 57.00 | 47.00 |
| Bess. billets, Pittsburgh... | 65.00 | 60.00 | 60.00 | 38.50 |
| O-h. billets, Pittsburgh... | 65.00 | 65.00 | 60.00 | 38.50 |
| O-h. sheet bars, P'gh... | 70.00 | 70.00 | 75.00 | 42.00 |
| Forging billets, base, P'gh. | 85.00 | 85.00 | 85.00 | 51.00 |
| O-h. billets, Phila... | 69.10 | 69.10 | 64.10 | 42.50 |
| Wire rods, Pittsburgh... | 75.00 | 75.00 | 75.00 | 52.00 |

Finished Iron and Steel,

| Per Lb. to Large Buyers: | Cents | Cents | Cents | Cents |
|-----------------------------|-----------------|-------|-------|-------|
| Iron bars, Philadelphia... | 4.75 | 4.75 | 4.25 | 2.595 |
| Iron bars, Pittsburgh... | 4.75 | 4.75 | 4.25 | 2.75 |
| Iron bars, Chicago... | 3.75 | 3.75 | 3.75 | 2.50 |
| Steel bars, Pittsburgh... | 3.50 | 3.50 | 3.50 | 2.35 |
| Steel bars, New York... | 4.02 | 4.02 | 4.02 | 2.62 |
| Tank plates, Pittsburgh... | 3.25 | 3.50 | 3.50 | 2.62 |
| Tank plates, New York... | 3.77 | 3.77 | 3.77 | 2.92 |
| Beams, etc., Pittsburgh... | 3.10 | 3.10 | 3.10 | 2.45 |
| Beams, etc., New York... | 3.27 | 3.27 | 3.27 | 2.72 |
| Skelp, grooved steel, P'gh. | 3.25 | 2.75 | 2.75 | 2.45 |
| Skelp, sheared steel, P'gh | 3.50 | 3.00 | 3.00 | 2.65 |
| Steel hoops, Pittsburgh... | 5.50 | 5.50 | 5.00 | 3.05 |

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

| Sheets, Nails and Wire, Per Lb. to Large Buyers: | July 20, 1920 | July 13, 1920 | June 22, 1920 | July 22, 1919 |
|--|------------------|------------------|------------------|------------------|
| Sheets, black, No. 28, P'gh. | 7.50 | 6.50 | 5.50 | 4.35 |
| Sheets, galv., No. 28, P'gh. | 9.00 | 8.00 | 7.00 | 5.70 |
| Sheets, blue an'l'd, 9&10. | 6.00 | 5.00 | 4.50 | 3.55 |
| Wire nails, Pittsburgh... | 4.00 | 4.00 | 4.00 | 3.25 |
| Plain wire, Pittsburgh... | 3.50 | 3.50 | 3.50 | 3.00 |
| Barbed wire, galv., P'gh. | 4.45 | 4.45 | 4.45 | 4.10 |
| Tin plate, 100-lb. box, P'gh. | \$7.00 | \$7.00 | \$7.00 | \$7.00 |

Old Material, Per Gross Ton:

| | | | | |
|-----------------------------|------------------|---------|---------|---------|
| Carwheels, Chicago | \$35.50 | \$35.50 | \$35.50 | \$24.00 |
| Carwheels, Philadelphia... | 38.00 | 38.00 | 38.00 | 23.00 |
| Heavy steel scrap, P'gh... | 26.00 | 26.00 | 25.00 | 20.50 |
| Heavy steel scrap, Phila... | 22.50 | 22.50 | 23.00 | 19.00 |
| Heavy steel scrap, Ch'go. | 24.00 | 23.50 | 23.00 | 19.50 |
| No. 1 cast, Pittsburgh... | 40.00 | 40.00 | 32.00 | 22.50 |
| No. 1 cast, Philadelphia... | 38.00 | 37.00 | 37.00 | 22.00 |
| No. 1 cast, Ch'go (net ton) | 36.00 | 36.00 | 35.50 | 22.00 |
| No. 1 RR. wrot, Phila... | 33.00 | 33.00 | 33.00 | 25.00 |
| No. 1 RR. wrot, Ch'go (net) | 24.50 | 25.00 | 25.00 | 17.00 |

Coke, Connellsville,

Per Net Ton at Oven:

| | | | | |
|-------------------------|---------|---------|---------|--------|
| Furnace coke, prompt... | \$17.00 | \$17.00 | \$17.00 | \$4.00 |
| Furnace coke, future... | 11.50 | 11.50 | 11.50 | 4.12 |
| Foundry coke, prompt... | 18.00 | 18.00 | 17.00 | 5.00 |
| Foundry coke, future... | 14.00 | 14.00 | 16.00 | 5.00 |

Metals,

| Per Lb. to Large Buyers: | Cents | Cents | Cents | Cents |
|----------------------------|------------------|-------|-------|-------|
| Lake copper, New York... | 19.00 | 19.00 | 19.00 | 23.75 |
| Electrolytic copper, N. Y. | 19.00 | 19.00 | 19.00 | 23.50 |
| Zinc, St. Louis... | 7.95 | 7.85 | 7.45 | 8.00 |
| Zinc, New York... | 8.20 | 8.20 | 7.80 | 8.35 |
| Lead, St. Louis... | 8.50 | 8.15 | 7.90 | 5.50 |
| Lead, New York... | 8.75 | 8.40 | 8.15 | 5.75 |
| Tin, New York... | 49.50 | 50.25 | 50.00 | 70.00 |
| Antimony (Asiatic), N. Y. | 7.50 | 7.50 | 7.75 | 9.25 |

All prices in above tables are for domestic delivery and do not necessarily apply to export business.

While the more general belief is that the award is eminently fair and that it will find reflection in improved railroad operations through the return of experienced workmen now out on strike, there are some who profess to fear that the men will not be satisfied and that a strike is possible. It is a fact, also, that a great many believe that something more than increased efficiency is necessary to correct the conditions created by the strike of the yard workmen.

Independent plants are kept in comparatively full operation, but congestion is so serious with most of the Steel Corporation subsidiaries that their performances are on a gradually diminishing scale. Neither the National nor Pennsylvania works of the National Tube Co., which suspended on July 3, has yet resumed, and at other plants of this company operations are irregular and based largely on the day to day car supplies. The Carnegie Steel Co. has its Bellaire, Ohio, Sharon and Monessen, Pa., plants entirely down, while some of its capacity at its Youngstown, Ohio, works, including two bar mills, and a 48-in. blooming mill is idle. Pittsburgh City mills of this company are running intermittently, depending upon ability to obtain steel from other plants. Not more than 60 per cent of the capacity of the American Sheet & Tin Plate Co. is in use. It still must be said that the danger exists of enforced curtailment and possibly suspension.

In a broad way it can be stated that the pressure on the part of buyers of steel for supplies is not quite so heavy as it was a short time ago. This reflects to some extent the slowing down in the automobile industry, which, although it does not consume much in excess of 6 to 7 per cent of the country's total output of steel, nevertheless has been a potent factor in the extremely high prices which have ruled for early deliveries in a number of lines. Steel prices, however, are in the main well sustained because none of the manufacturers has reached a position where it is necessary to seek business. The recent advance in pig iron for prompt ship-

ment is well sustained and indications point to still higher prices, as demands for spot tonnages still greatly exceed the available supply. Further stiffening in the price of coke is another factor of strength in the pig iron market.

Pig Iron.—As far as sales are concerned, the market must be considered as quiet, but this is not a true statement of actual conditions. Iron that is loaded on cars or is lying on blast furnace yards, and can be moved promptly, can be sold without effort, and the price is of secondary importance to consumers who must have supplies. Although \$46, Valley furnace, has not yet been exceeded on either basic or Bessemer, the one merchant producer here who has been taking any business lately would not consider less than \$47 on either grade for iron to be delivered immediately. The scarcity of merchant supplies of Northern basic is so acute that there is some talk of bringing Southern basic into this district. At present the latter is quoted at \$42, Birmingham, which would make a delivered price of \$47.70, Pittsburgh, as compared with \$47.40, the present delivered Pittsburgh price of Valley iron of this grade. Sales recently noted include 3000 tons of basic for prompt delivery at \$46, Valley furnace, to a central Ohio sheet maker. The Monongahela Iron & Steel Co., which recently put out an inquiry for 5000 tons of Bessemer for fourth quarter and first quarter 1921 delivery, has closed for 1000 tons for fourth quarter and withdrawn the remainder of its inquiry. Its purchase was made at \$45, Valley furnace, but in explanation of this seeming reaction in the price, it is stated that the buyer exercised an option given at \$45 before the market advanced. A sale of 1500 tons of No. 2 foundry for prompt delivery is reported at \$46 at a western Pennsylvania furnace. Some of this iron was for shipment to Cleveland and some to a melter in the Youngstown district. The Westinghouse Electric & Mfg. Co. recently bought 2000 tons of foundry iron for

its Cleveland foundries, and while prices are not made public, it is understood to be around \$45, furnace, for the base grade. The furnace of the Sharpsville Furnace Co., Sharpsville, Pa., was blown out last Saturday night. This leaves only the Ella, Claire, Alice, Stewart and Nos. 1 and 3 Shenango furnaces in the Shenango Valley still making iron. The furnace of the A. M. Byers Co. at Girard, Ohio, has been banked and that of the McKeefrey Iron Co. at Leetonia, Ohio, has been blown out.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being \$1.40 per gross ton:

| | |
|---------------|---------|
| Basic | \$46.00 |
| Bessemer | 46.00 |
| Gray forge | 43.00 |
| No. 2 foundry | 45.00 |
| No. 3 foundry | 43.50 |
| Malleable | 45.00 |

Ferroalloys.—Demands for ferromanganese are so few and small that recent prices are not especially well maintained. Buyers no longer have to pay more than \$225, delivered, for prompt tonnages of 76 to 80 per cent domestic material, and a firm bid of \$5 to \$10 per ton less probably would get consideration. Consumers are well covered by contract against last half requirements and since they are getting sufficient quantities on these purchases to carry them along and as the cost of such material averages well below \$200, the lack of strength in the spot market readily is understood. Shipment soon will start on a sale of 2000 tons of this material made by a western Pennsylvania producer to go to a Nova Scotia steel company. This sale carried a price of \$200, delivered. Spiegeleisen still is quoted at \$75, furnace, for average 20 per cent material, but that price has not been done on any Pittsburgh district business. Ferrosilicon, both high and low-grade, still is neglected and prices are not as firm as they appear to be from the fact that they are unchanged from those of a week ago. As far as Pittsburgh district sales are concerned, quotations are more of an asking than a selling basis.

We quote 76 to 80 per cent domestic ferromanganese \$200 for last half and \$220 to \$225 for prompt delivery, with a reduction of \$1.50 to \$1.75 per unit for lower percentages. We quote 50 per cent ferrosilicon at \$80 to \$85 and 18 to 22 per cent spiegeleisen at \$70 to \$75, furnace. Prices on Bessemer ferrosilicon are: 9 per cent, \$64; 10 per cent, \$67.50; 11 per cent, \$70.80; 12 per cent, \$74.10. We quote 5 per cent silvery iron, \$54.50; 7 per cent, \$56; 8 per cent, \$58; 9 per cent, \$60, and 10 per cent, \$62.50. An advance of \$3.30 per gross ton is charged for each 1 per cent silicon for 11 per cent and over on Bessemer ferrosilicon, and an advance of \$2.50 per gross ton is charged for each 1 per cent silicon for 11 per cent and over on silvery iron. All the above prices are f.o.b. makers' furnace, Jackson or New Straitsville, Ohio, which has a uniform freight rate of \$2.30 per gross ton for delivery in the Pittsburgh district.

Structural Material.—New inquiries are extremely few and the tendency to defer closing on projects, which have been under contemplation for some time, still is marked. No important structural lettings are reported by interests in this district for the past week, and shop activities are diminishing because of the scarcity of cars. Plain material is available in sufficient quantities, but to fabricate with the car supply so limited soon would result in serious congestion, which it is desired to avoid. Although structural shapes are held as high as 3.50c., the company quoting that figure would not insist upon it on attractive tonnages. Prices are given on page 231.

Nuts, Bolts and Rivets.—Makers still are declining practically all business that is being offered, particularly in nuts, owing to their already huge obligations and the continued difficulty in securing supplies of raw material. Prices and discounts are given on page 231.

Plates.—No improvement is noted in the demand, and the market still is more favorable to buyers than sellers. While the independent manufacturers are quoting 3½c., this price has not been done very often lately, and 3¼c. now appears to be the more general maximum, based on sales.

We quote sheared plates of tank quality, ¼ in. and heavier, at 2.65c. to 3c. for deferred delivery, while mills which will agree to make specified delivery are quoting 3.50c., but are taking attractive tonnages at 3.25c.

Hot-Rolled Strips.—A somewhat slower market in cold-rolled strips is reflected in the market for hot-rolled material, but this occasions no easing in prices of the latter, which hold at from 5.50c. to 7c. per

lb. at mill, with the bulk of the tonnage carrying a minimum of 6c. The lower figures refer chiefly to business taken subject to price at time of delivery and is hardly to be considered representative of the market on tonnages where specified delivery is promised. All makers are several months behind in their bookings and the shortage of cars is preventing them from catching up. Less trouble is experienced in obtaining steel than in moving out the finished product.

Cold-Rolled Strips.—Although there are signs of a revival in the metal bed business, with an attendant increase in the demand for strip steel for this purpose, and more demand also is developing from the manufacturers of molding and domestic electrical appliances, the improvement in these directions hardly compensates for a lighter demand from the automotive industry. While sales still are fairly common up to 10c. base, per lb. mill, that price no longer is often exceeded as it was a short time ago, when there were some urgent demands from automobile builders. The range of prices still is 8.50c. to 10c., but generally 9c. is minimum.

Cold-Finished Steel Bars.—Demand has lost much of its recent snap as far as steel for use in the automobile industry is concerned, although some of the latter who are well off financially still are fairly good buyers. Machine tool companies now are the best buyers of these bars. Large makers are quoting 4.10c. to 4.25c., base, Pittsburgh, but such prices are for rather indefinite delivery. For specified delivery, 6c. is minimum and for 9/16 in. and 1/2 in. rounds as high as 10c. continues to be done.

Iron and Steel Pipe.—Conditions still are extremely acute as far as supplies are concerned, as all makers, especially the National Tube Co., still are suffering from the shortage of railroad cars. Jobbers in the Pittsburgh district have been able to get some material by motor truck, but because of the high cost have cut their basing discounts on both black and galvanized steel pipe five points, which is equivalent to an advance of \$10 per ton. Discounts on the base charges now quoted by jobbers are 41½ per cent on black and 26½ per cent on galvanized. Prices and discounts are given on page 231.

Wire Products.—Although the recent advance announced by the Pittsburgh Steel Co. has not yet been followed by other independent makers, it is probable that they will later, as a couple of them already have stopped taking business at the recent basis, and now are entering orders subject to price at time of delivery. While the pressure of buyers for supplies of steel generally is lighter than it has been, this is not the case in nails and wire, makers of which are still turning down more business than they are accepting.

We quote wire nails at \$3.25 base, as the price of the American Steel & Wire Co., and \$4 to \$4.50 by independent mills. We quote bright basic wire at \$3, the price of the American Steel & Wire Co., and \$3.50 to \$4 the price range of the independent mills.

Wire Rods.—No relaxation is observed in the demand, nor are prices any easier than they have been, the independent market still being quotable at \$75 for base size common soft rods. Makers here still are heavily sold up and there are no tonnages available for the new demand except where buyers are providing shipping conveyances. Prices are given on page 231.

Spikes.—Makers report a falling off in the demand for both large and small spikes in the past week. This development finds no reflection in prices, which are exceedingly firm, due to the fact that present bookings are sufficient to engage capacity for the next two or three months. Prices are given on page 231.

Billets and Sheet Bars.—Prices on billets and sheet bars, and for that matter on all kinds of semi-finished steel except boiler tube skelp and wire rods, are receding. Finishing mills do not appear able to absorb all the steel that is reaching them, due to the congestion of finished products, resulting from the transportation situation and the shortage of cars. This condition not only affects the demand but also is keeping back specifications against contracts. Makers in this district are holding for \$65 on 4 x 4 in. rerolling billets and claim to have declined business at less money. It

is a fact that some makers having accumulations have been willing to shave this price slightly to effect quick sales. However, in the case where the buyer seeks the producer, \$65 is the minimum price on both open-hearth and Bessemer steel, and on small billets makers are holding firmly to \$70. It is doubtful whether \$70 is being exceeded on sheet bars, as it is known that one maker having plants in the East and in western Pennsylvania, and also a Chicago producer, recently have been offering tonnages at \$70.

We quote 4 x 4-in. soft Bessemer and open-hearth billets at \$38 to \$65; 2 x 2-in. billets, \$42 to \$70; Bessemer sheet bars, \$42 to \$65; open-hearth sheet bars, \$42 to \$70, and forging billets, ordinary carbons, \$80 to \$90 base, all f.o.b. Youngstown or Pittsburgh mill.

Sklp.—The Superior Pipe Co., with a plant at Columbia, near Harrisburg, Pa., has placed 4200 tons for early delivery, but other details of the sale are not available. This constitutes the only important business recently done. While some business was done a short time ago in steel pipe skelp at 4c., one independent maker now is quoting 3.25c. for grooved and universal and 3.50c. for sheared skelp on domestic orders. Keen demand is noted for boiler tube skelp, but makers are so heavily committed as to be unable to give new business any attention.

Steel Rails.—The market in light rails is not especially active and is slightly easier. One company, which is quoting 25- to 45-lb. sections at 3.75c. would not decline business at 3.50c. and another which a short time ago made sales at 3.50c. to 3.60c., now is quoting 3.25c.

The Carnegie Steel Co. is still quoting the March 21, 1919, prices, these being 2.45c. for 25 to 45-lb. sections, 2.49½c. for 16-lb. and 20-lb. sections, 2.54c. for 12-lb. and 14-lb. sections, and 2.58½c. for 8-lb. and 10-lb. sections. This company is also quoting standard sections 50 lb. and heavier at \$45 for Bessemer and \$47 for open hearth stock. The Cambria Steel Co. is quoting 25-lb. to 45-lb. sections at 3.75c., 16-lb. and 20-lb. sections, 3.79½c., 12-lb., 3.84c. at mill, for such delivery as it can make.

Boiler Tubes.—Even more acute than the shortage of pipe is that in boiler tubes, all makers of which are several weeks behind in their deliveries, and on which the National Tube Co. is sold over the turn of 1921. While pipe is piled up at the mills waiting for shipment, manufacturers' stocks of boiler tubes almost are nil. Discounts are given on page 231.

Coke.—The market here has strengthened further since last reports, with sales of prompt furnace fuel now being done as high as \$18.50 per net ton at oven. No recent prompt shipment business in foundry coke has been at less than \$18 per net ton at oven and \$19 has been the more common figure on such business. The continued strength of the market may be explained by the fact that car placements still are inadequate for any material increase in production, while the availability of coal cars and the extremely attractive prices which prevail for that commodity cause some operators to pay little attention to their coke obligations. One prominent producer, most of whose coke production had been sold on contract over the remainder of the year, at an extremely low price compared with contract prices in general, is reported to be shipping practically nothing but coal at present. This development forces customers of this producer into the market for spot tonnage and is one of the contributory causes of the present high prices. While it is by no means a general condition, a number of coke producers are making only feeble efforts to supply tonnages on contracts because of the much higher prices which can be obtained for spot tonnages. Virtually none of the contracts placed for last half furnace coke made at fixed prices call for a higher figure than \$12 per net ton at oven, and in the scale contracts based on the prices of Valley basic pig iron, maximum prices of from \$10 and \$12 were named in most of them. The full range of prices on furnace coke is from \$17 to \$18.50 per net ton at oven and on spot foundry grade, about \$1 per ton higher.

Tin Plate.—This product is one where the pressure for supplies shows no material relaxation. Notwithstanding the preference granted in the matter of car supplies by the Car Service Association of the Interstate Commerce Commission, for the movement of perishable food container plates, the can companies still are short of supplies and cars are so scarce that early

relief appears unlikely. Stocks at the various mills, though much lighter than they were recently, still are heavy, no less than 105 carloads being held at the New Kensington, Pa., plant of the American Sheet & Tin Plate Co. This company has about 60 per cent of its tin plate capacity in operation, but independent mills are more fully engaged, and the average for the entire industry is estimated at about 75 per cent.

We now quote tin plate to domestic consumers for remainder of the year delivery at \$7 to \$8.50 base box stock items \$9 to \$10, and for export \$11 to \$12 per base box, all f.o.b. Pittsburgh.

Iron and Steel Bars.—While demands are considerably less urgent in both iron and steel bars, makers are so heavily committed that they are not obliged to seek business and prices are well sustained. Steel bars for immediate shipment from independent mills cannot yet be secured much under 4c. base, but for third and fourth quarter delivery the independent market is more properly quoted at from 3c. to 3.50c.

We quote steel bars rolled from billets at 2.35c., this being the price of the Carnegie Steel Co. for very indefinite delivery, likely not before first quarter of next year. Other mills rolling steel bars from billets quote from 3c. to 3.50c. at mill, prices depending entirely on the buyer and the delivery wanted. We quote reinforcing bars, when rolled from billets, at 4c. to 4.25c., and from old steel rails at about 3.50c. at mill. We quote common iron bars at 4.75c. and refined iron bars at 5c. in carloads, f.o.b. mill, Pittsburgh.

Sheets.—Business is quiet, not because of lack of demand, but because makers generally have bookings sufficient to engage capacity well over the remainder of this year. Some of the independent makers are taking on a little third quarter tonnage for which they are obtaining extremely fancy prices, sales of black sheets being noted up to 8.25c., and galvanized up to 9c., blue annealed up to 7c. Some rather good-sized tonnages of the latter for delivery in the present quarter recently have been booked at 5.75c. and 6c.

Old Material.—No material change is observed in scrap iron and steel prices, but this fact finds its chief explanation in the fact that trading is much circumscribed by the railroad situation, which makes impossible the loading of open-top cars with sides of less than 36 in. except in the direction, while the movement of loaded cars is entirely by permit. The railroads are issuing permits only when evidence is presented to show that the material is going to a point where it will be unloaded, and that the cars will not be shunted from one point to another in the effort of the shipper to find an outlet. Steel makers in this district appear willing to pay \$26 per gross ton, delivered, for heavy melting steel and might possibly go 50c. per ton higher. Offerings are scant at these figures and buyers admit little success in obtaining more than small tonnages. Users of machine shop turnings have big stocks on their yards and are practically out of the market for fresh supplies at present. Sales of short shoveling turnings are noted at \$18 per gross ton delivered. Cast scrap of all sorts remains scarce and prices are very firm. On account of the poor deliveries of pig iron, non-integrated steel makers would pay up to \$34, delivered, for heavy breakable cast.

We quote for delivery to consumers' mills in the Pittsburgh and other districts that take Pittsburgh freight rates as follows:

| | |
|---|--------------------|
| Heavy melting steel, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, deliv. | \$26.00 to \$26.50 |
| No. 1 cast (for cupola)..... | 40.00 to 41.00 |
| Rerolling rails, Newark and Cambridge, Ohio; Cumberland, Md.; Franklin, Pa., and Pittsburgh.... | 34.00 to 35.00 |
| Compressed sheet steel..... | 21.00 to 22.00 |
| Bundled sheet sides and ends, f.o.b. consumers' mills, Pittsburgh dist. | 14.00 to 15.00 |
| Railroad knuckles and couplers.... | 28.50 to 29.00 |
| Railroad coil and leaf springs..... | 28.50 to 29.00 |
| Railroad grate bars..... | 30.00 to 31.00 |
| Low phosphorus melting stock (bloom and billet ends, heavy plates) ¼ in. and heavier..... | 31.00 to 32.00 |
| Railroad malleable | 32.00 to 33.00 |
| Iron car axles | 50.00 to 51.00 |
| Locomotive axles, steel..... | 36.00 to 37.00 |
| Steel car axles..... | 42.00 to 43.00 |
| Cast iron wheels..... | 29.00 to 30.00 |
| Rolled steel wheels..... | 29.00 to 30.00 |
| Machine shop turnings..... | 12.50 to 13.00 |
| Sheet bar crop ends (at origin).... | 26.00 to 27.00 |
| Heavy steel axle turnings..... | 20.50 to 21.00 |
| Heavy breakable cast..... | 33.00 to 34.00 |
| Cast iron borings..... | 17.75 to 18.25 |
| No. 1 railroad wrought..... | 31.00 to 32.00 |

Chicago

CHICAGO, July 20.

Although transportation is still far from satisfactory, some substantial improvement is reflected in the reports received from producers in this district. The leading merchant iron interest is shipping as much as it is producing, while in the case of the foremost steel interest shipments are now exceeding output and some progress is being made in reducing the accumulation of finished material piled in its yards. While shipments have increased, operation remains unchanged, principally because receipts of coal are not improving. Both the leading steel interests and the foremost independent continue to operate at about 80 per cent of ingot capacity. Unless further labor troubles ensue on the railroads, however, it is felt that transportation service will improve to a greater extent and that better production will result. In this connection the award of the Railroad Labor Board made public to-day is of widespread interest. Early announcements by the Brotherhood leaders indicate that the advances granted are not satisfactory to the men. Yet a perusal of the award shows that substantial increases were given to some classes of employees, particularly those receiving the lower wages.

In the iron and steel market, pig iron stands out prominently because of purchases and inquiries for last half and 1921 deliveries. Two sales of several thousand tons of foundry for delivery in the first half of next year have been closed at \$46 base, Ohio furnace. In finished steel products, plates and shapes continue to show signs of weakness, and bars also are less firm, one order for third quarter delivery having been taken by an independent at 3c., Pittsburgh. There is some activity in light rails and track fastenings, while wire products, and bolts and nuts, remain as strong as ever. Cast-iron pipe is exceedingly dull and scrap is slow.

Ferroalloys.—We note a sale of 130 tons of spiegel-eisen for prompt delivery at \$75, Eastern furnace. There continues to be some activity in ferromanganese, but ferrosilicon is dull.

We quote 75 to 80 per cent ferromanganese, last half, delivered, \$200; third quarter, \$225; spot, \$240 to \$250; delivered; 50 per cent ferrosilicon at \$85, delivered; spiegel-eisen, 18 to 22 per cent, \$70 to \$75 furnace.

Plates.—The absence of new inquiry from Japan and the cancellation of old orders from that country, the decline in tank construction work in the South-western oil fields, and the failure of railroad car construction to assume large proportions have all contributed to a slackening of activity in plates. While the leading local interest is booked ahead for the remainder of the year and the foremost independent for from two to three months, some Eastern mills are promising fairly prompt shipment, in some cases as good as from 10 days to two weeks. Independents continue to take some business at 3.50c., Pittsburgh, but 3.75c. is steadily becoming more common in transactions in this district. A confidential inquiry for 750 freight cars calls for 9500 tons of plates, shapes and bars and 1500 tons of axles, while 200 stone cars now being figured on will require 3300 tons of plates, bars and shapes. The Havana Central is in the market for 100 flat cars, requiring 450 tons. The Santa Fe wants 100 draft sill reinforcements, which will account for about 200 tons, principally plates. The Illinois Central has bought 300 stock cars from the American Car & Foundry Co., for which a Steel Corporation subsidiary will furnish 2100 tons of plates, shapes and bars.

The mill quotation is 2.65c. to 3.50c., Pittsburgh, the freight to Chicago being 27c. per 100 lb. Jobbers quote 3.67c. to 4.17c. for plates out of stock.

Pig Iron.—The market is noteworthy not only because of the appearance of considerable third quarter and last half tonnage, but because some 1921 business has been closed and more is before the trade. Two sales involving several thousand tons of foundry for shipment in the first half of next year have been closed at \$46 base, Ohio furnace. A current inquiry for foundry calls for 2000 tons to be shipped in the fourth quarter and 4000 tons in the first half of 1921. A sale of 2000 tons of malleable for last half delivery has

been made at the regular market quotations, while an inquiry for 6000 tons of foundry for the same delivery is current. The demand for prompt and third quarter iron is steadily becoming more active, this being attributed to the desire of melters to secure deliveries before the anticipated freight advance takes effect. A local foundry has bought 300 tons of foundry for July and August delivery at \$42 base, Birmingham, and another sale of a like amount for immediate delivery has been closed on the same terms. An inquiry for 500 tons of foundry for early shipment is expected to develop into an order shortly. With the disappearance of resale material, silvery is becoming stiffer. Several sales ranging from carload lots to 500 tons have been made during the week. Low phosphorus is also showing more life, several hundred tons having been sold recently. An Ohio furnace is now quoting \$57, furnace, on copper free material, as against \$54 by makers further east. A scarcity of malleable and low phosphorus is becoming apparent in this district. Charcoal iron is inactive.

The following quotations are for iron delivered, at consumers' yards except those for Northern foundry, malleable and steel-making irons, including low phosphorus, which are f.o.b. furnace and do not include a switching charge averaging 50c. per ton.

| | |
|--|------------------|
| Lake Superior charcoal, averaging sil. | |
| 1.50 (other grades subject to usual differentials), deliv. at Chicago... | \$57.50 |
| Northern coke, No. 1, sil. 2.25 to 2.75, last half | 47.25 |
| Northern coke No. 1 spot | 47.25 |
| Northern coke foundry, No. 2, sil. 1.75 to 2.25 last half | 45.00 |
| Northern coke, No. 2, spot | 45.00 |
| Northern high phos., last half | 45.00 |
| Southern coke, No. 1 foundry and No. 1 soft sil. 2.75 to 3.25 | 50.20 |
| Southern coke, No. 2 foundry sil. 2.25 to 2.75 | 48.70 |
| Southern foundry sil. 1.75 to 2.25 | 47.00 |
| Malleable not over 2.25 sil. | 45.00 |
| Basic | 45.00 |
| Low phos. (copper free) | 54.00 |
| Silvery, 7 per cent | \$56.40 to 59.80 |

Structural Material.—Construction activity is at a low ebb and structural shapes can be had for early delivery at as low as 3c., Pittsburgh. There have been few fabricating awards and inquiries during the past week. The Leonard Construction Co., Chicago, is asking for figures on 250 tons for mill house No. 3 for the Larrow Milling Co., Toledo. The Federal Bridge & Structural Co., Waukesha, Wis., will fabricate 235 tons for a power plant and foundry addition for the Van Brunt Mfg. Co., Horicon, Wis., 160 tons for a plant to be erected by the Globe Electric Co., Milwaukee, and 125 tons for a new hydroelectric generating plant to be constructed by the Wisconsin Valley Electric Co. at Wausau, Wis. The Chicago Bridge & Iron Co. will furnish 124 tons for water tank towers to be erected by the Chicago and Northwestern in this city. The McClintic-Marshall Co. will fabricate 600 tons for extensions to the seamless tube plant to be built by the Steel & Tube Co. of America at Indiana Harbor, Ind. The same steel company is inquiring for 650 tons for a trestle from its ore bins to its coke plants at Indiana Harbor.

The mill quotation is 2.45c. to 3.50c., Pittsburgh, which takes a freight rate of 27c. per 100 lb. for Chicago delivery. Jobbers quote 3.47c. to 3.97c. for materials out of warehouse.

Railroad Rolling Stock.—In addition to the car orders and inquiries mentioned in the plate paragraph, we note the following: The Chicago, Milwaukee & St. Paul is inquiring for figures on the repair of 100 box cars and 1000 gondolas. The Chilean State Railways are in the market for 845 freight cars of various types. The Northern Pacific wants 100 caboose cars; the Chicago & Northwestern, 50 caboose cars, and the Monon, six caboose cars and 10 caboose underframes. The Cuyamel Fruit Co., Houston, Texas, is inquiring for 50 cane cars, 50 banana cars, and 20 box cars. The Santa Fe proposes to fit 1400 refrigerator cars with draft sill reinforcements. It is now asking for figures on the reinforcement of 100, as noted in the plate paragraph. The American Car & Foundry Co. will furnish the Illinois Central with 300 underframes for the repair of cars in the railroad's own shops. The Gulf Coast lines contemplate the purchase of about 1000 cars of various types, but have not yet arranged for the financing.

Bars.—There continues to be a shortage of light sizes of soft steel bars, particularly flats, but the de-

mand for heavier sizes has fallen off materially. The latter class of bars is used extensively by forge shops serving the automobile industry which, according to persistent reports, has suffered a reaction. Transactions in this district indicate a downward tendency in prices quoted by independents. Not only has 3.50c., Pittsburgh, been done frequently, but one order for third quarter shipment was closed at 3c. So far as the two leading local interests are concerned, however, no new business is being taken on except in connection with car orders when bars are complementary to plates and shapes. There is little change in the situation in bar iron and rail carbon steel bars.

Mill prices are: Mild steel bars, 2.35c. to 4c.; Pittsburgh taking a freight of 27c. per 100 lb.; common bar iron, 3.75c. to 4c.; Chicago; rail carbon, 3.75c., mill.

Jobbers quote 3.37c. to 3.87c. for steel bars out of warehouse. The warehouse quotation on cold rolled steel bars is 4.50c. for rounds and 6.30c. for flats and squares, an extra of 1c. per 100 lb. applying to orders exceeding 1000 lb. and under 2000 lb. and an extra 35c. for orders up to 1000 lb.

Sheets.—While prices are still very firm, some mills, particularly a number of the newer Ohio companies, are again booking business. The two local makers are still out of the market.

Mill quotations are 4.35c. to 8c. for No. 28 black; 3.55c. to 7c. for No. 10 blue annealed, and 5.70c. to 9c. for No. 28 galvanized, these all being Pittsburgh prices, subject to a freight of 27c. per 100 lb. to Chicago. The lowest prices are those of March 21, 1919.

Jobbers quote: Chicago delivery out of stock, No. 10 blue annealed, 6.02c. to 7.02c.; No. 28 black, 7c. to 8c.; No. 28 galvanized, 8.50c. to 9.50c.

Wire Products.—The situation is unchanged so far as production and shipments are concerned. The demand, if anything, is heavier. Jobbers are unable to accumulate any stocks; in fact, they are distributing shipments among customers as soon as they arrive from the mills. Few warehouses have any wire products in stock, but the leading local jobber is still able to make limited shipments on black annealed wire and bright basic wire at 4.92c., base, on wire nails at 5.75c. and on cement coated nails at 5.10c., base, Chicago. For mill prices see finished iron and steel, f.o.b. Pittsburgh, page 231.

Rails and Track Supplies.—Railroads continue to press the local mill to take on 1921 business in standard section rails, but as yet no orders have been accepted. There is a good demand for light rails and track fastenings. Although heavily booked, the leading interest continues to add to its commitments in a limited way. The foremost independent is also well booked on spikes and track bolts and is accepting new orders sparingly. Tie plates remain active.

Standard Bessemer rails, \$45 to \$55; open hearth rails, \$47 to \$57. Light rails, 2.45c. to 3.50c., f.o.b. makers' mills.

Standard railroad spikes, 3.55c. to 4.25c., Pittsburgh. Track bolts with square nuts, 4.90c. to 7c., Pittsburgh. Steel tie plates and steel angle bars, 2.75c., Pittsburgh and Chicago, tie plates, iron, 3.75c. to 4c., f.o.b. makers' mills.

Cast Iron Pipe.—The market is dull and without features.

We quote per net ton f.o.b. Chicago, ex-war tax as follows: Water pipe, 4-in., \$79.80; 6-in. and above, \$76.80; class A and gas pipe, \$2 extra.

Bolts and Nuts.—There is a heavy demand for the smaller sizes, but in the larger sizes consumers are fairly well covered. Production in this territory is good, considering transportation difficulties, but it has not yet reached the point where it can keep abreast of the requirements of consumers. Makers have received a few requests of late to hold up shipments because buyers had failed to secure other materials needed in their operations. For mill prices, see finished iron and steel, f.o.b. Pittsburgh, page 231.

Jobbers quote structural rivets, 5.62c.; boiler rivets, 5.75c.; machine bolts up to 3/4 x 4 in., 20 per cent. off; larger sizes, 10 off; carriage bolts up to 3/4 x 6 in., 10 off; larger sizes, 5 off; hot pressed nuts, square tapped and hexagon tapped, list price; coach or lag screws, gimlet points, square heads, 30 per cent. off. Quantity extras are unchanged.

Old Material.—While the market is dull, open-hearth steel has advanced in anticipation of further purchases, and No. 1 busheling has risen as a result of moderate buying at increased prices. Transportation remains a decided brake on business, but a slight improvement has been noted since the Commerce Commission order covering open-top cars was modified to the extent of permitting the unrestricted use of cars with sides up to 36 in. Box cars, also, are being used more extensively,

particularly in shipments to foundries. One rolling mill has also agreed to accept shipments in that type of equipment. Railroad lists have fallen off. The Rock Island offers 3000 tons, the Soo Line 1400 tons and the Michigan Central a blank list.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

| | |
|--|--------------------|
| Iron rails | \$34.00 to \$35.00 |
| Relaying rails | 52.50 to 57.50 |
| Car wheels | 35.50 to 36.00 |
| Steel rails, rerolling | 34.00 to 35.00 |
| Steel rails, less than 3 ft. | 28.00 to 28.50 |
| Heavy melting steel | 24.00 to 24.50 |
| Frogs, switches and guards, cut apart .. | 24.00 to 24.50 |
| Shoveling steel | 23.50 to 24.00 |
| Low phos. heavy melting steel | 28.00 to 28.50 |
| Drop forge flashings | 20.50 to 21.00 |

Per Net Ton

| | |
|-----------------------------------|--------------------|
| Iron angles and splice bars | \$31.00 to \$31.50 |
| Steel angle bars | 23.50 to 24.00 |
| Iron arch bars and transoms | 32.00 to 32.50 |
| Iron car axles | 41.00 to 41.50 |
| Steel car axles | 33.50 to 34.00 |
| No. 1 busheling | 20.00 to 20.50 |
| No. 2 busheling | 12.50 to 13.00 |
| Cut forge | 23.50 to 24.00 |
| Pipes and flues | 16.00 to 16.50 |
| No. 1 railroad wrought | 24.50 to 25.00 |
| No. 2 railroad wrought | 23.50 to 24.00 |
| Steel knuckles and couplers | 24.00 to 24.50 |
| Coil springs | 25.50 to 26.00 |
| No. 1 cast | 36.00 to 37.00 |
| Boiler punchings | 25.00 to 25.50 |
| Locomotive tires, smooth | 23.50 to 24.00 |
| Machine shop turnings | 9.50 to 10.00 |
| Cast borings | 12.50 to 13.00 |
| Stove plate | 27.50 to 28.00 |
| Grate bars | 28.00 to 29.00 |
| Brake shoes | 24.50 to 25.00 |
| Railroad malleable | 26.50 to 27.00 |
| Agricultural malleable | 26.00 to 26.50 |
| Country mixed | 15.50 to 16.50 |

Boston

Boston, July 20.

Pig Iron.—Total sales for the past week were between 7000 and 8000 tons, but nearer the former figure. Alabama has sold more freely than other brands, one furnace selling 1000 tons, silicon 2.25 to 2.75, delivery within a month, to a Rhode Island melter at \$43.25 furnace, 300 tons, silicon 2.75 to 3.25, nearby delivery, to a Connecticut consumer at \$45 furnace, and 300 tons, silicon 4.25 to 4.75, Oct. 1 to Nov. 1 delivery, to a Massachusetts foundry at \$48.25 furnace. These prices represent a modification of the furnace's differentials. Another Alabama furnace has sold about 2000 tons in 100 to 500-ton lots, silicon 2.25 to 2.75 and 2.75 to 3.25, mostly the latter, to Massachusetts, Connecticut and Rhode Island foundries at \$42 furnace base. This furnace has made heavy shipments on contract since the lifting of the embargo on New England railroads. A Virginia furnace early in the week raised its base price from \$45 to \$46 and opened its books for the last quarter and first half, 1921, but after taking on a small tonnage for last quarter, closed its books on all but 1921 business. Foundries are not anxious to buy 1921 iron, however, preferring to secure iron on contract before committing themselves further. Some last quarter iron, silicon 2.25 to 2.75 sold on a delivered basis of \$51.95. West Virginia furnaces are out of the market. Buffalo resale, silicon 2.75 to 3.25, prompt delivery, has sold at \$51.40 delivered and silicon 3.25 to 3.75 at \$52.65, or \$45 furnace base. The regular market on Buffalo is \$46 furnace. Prices on eastern Pennsylvania iron take a wide range, namely \$45 to \$48 base furnace, one furnace recently having advanced its price to \$48 with a \$2 differential. Comparatively little is selling, however, although one furnace is securing some averaging up business. Another sale of silvery, silicon 6.00 to 7.00, prompt shipment, at \$54.50 furnace, is reported. Delivered pig iron prices follow:

| | |
|--------------------------------------|--------------------|
| East. Penn., sil. 2.25 to 2.75 | \$49.15 to \$52.90 |
| East. Penn., sil. 1.75 to 2.25 | 47.90 to 50.90 |
| Buffalo, sil. 2.25 to 2.75 | 50.15 to 51.15 |
| Buffalo, sil. 1.75 to 2.25 | 48.90 to 49.90 |
| Virginia, sil. 2.75 to 3.25 | 52.20 to 53.20 |
| Virginia, sil. 2.25 to 2.75 | 50.95 to 51.95 |
| Virginia, sil. 1.75 to 2.25 | 47.70 to 50.70 |
| Alabama, sil. 2.75 to 3.25 | 53.00 to 54.15 |
| Alabama, sil. 2.25 to 2.75 | 51.25 to 52.40 |
| Alabama, sil. 1.75 to 2.25 | 50.00 to 51.15 |

Warehouse Business.—The lifting of railroad embargoes against New England shipments, so far, has had little visible effect on the movement of finished mill products, consequently local warehouse sales are still limited. Certain warehouses have paid large premiums for material offered in various sections of the country by the Government Surplus Board, so that local customers' needs may be met. Boston's supplies of iron and steel are as small as they have been during the past two or three years and prices are strong, but unchanged.

Jobbers quote: Soft steel bars, \$5.50 to \$6.50 per 100 lb. base; flats, \$6.50 to \$6.85; concrete bars, \$6 to \$6.50; tire steel, \$7 to \$7.50; spring steel, open hearth, \$11; crucible, \$16; steel bands, \$8 to \$8.25; steel hoops, \$9; toe calk steel, \$8; cold-rolled steel, \$10 to \$10.50; structural, \$6 to \$6.50; plates, \$6.50 No. 10 blue annealed sheets, \$9; No. 28 black sheets, \$9.15; No. 28 galvanized, \$10.50; refined iron, \$5.50 to \$8; best refined, \$7 to \$7.50; Wayne, \$8.50; band iron, \$8; hoop iron, \$9; Norway iron, \$20.

Coke.—No change in coke prices is noted. The New England Coal & Coke Co. has adapted a new distribution policy by allotting each New England broker a certain number of cars weekly to be applied to orders taken through said brokers.

Old Material.—Transactions in old material the past week have been few and far between. Local quotations have been governed entirely by advices from other cities rather than trade conditions here. No buying of heavy melting steel for export by local interests is reported, no steamer being available just now. A little No. 1 railroad wrought, wrought pipe, bundled skeleton and No. 1 machinery cast has been bought by dealers against old contracts, and scattering car-lots of borings and turnings, but sellers apparently are as indifferent as buyers, consequently prices continue more or less nominal. Old material f.o.b. local yards is quoted as follows:

| | |
|---|--------------------|
| No. 1 heavy melting steel..... | \$18.50 to \$20.50 |
| No. 1 railroad wrought | 26.00 to 27.00 |
| No. 1 yard wrought..... | 23.00 to 24.00 |
| Wrought pipe (1 in. in diameter, over 2 ft. long) | 16.00 to 17.00 |
| Machine-shop turnings | 13.00 to 14.00 |
| Cast-iron borings | 16.00 to 16.50 |
| Heavy axle turnings | 14.00 to 14.50 |
| Blast furnace borings and turnings..... | 13.00 to 14.00 |
| Forged scrap | 13.00 to 13.50 |
| Bundled skeleton | 13.00 to 13.50 |
| Street car axles | 31.00 to 32.00 |
| Car wheels | 37.00 to 38.00 |
| Machinery cast | 38.00 to 39.00 |
| No. 2 cast..... | 34.00 to 35.00 |
| Stove plate | 23.50 to 24.50 |
| Railroad malleable | 27.50 to 28.00 |
| Rerolling rails | 28.00 to 30.00 |

Buffalo

BUFFALO, July 19.

Pig Iron.—Operation and transportation problems are occupying the attention of furnacemen to the exclusion of selling. With the Interstate Commerce Commission ruling to be in force for another 30 days after July 21, it means that there is no immediate relief in sight. Furnaces are running very close on coke, which is as high as \$17, and cannot be obtained at that price in quantities sufficient to take care of the trade. Every furnace is piling iron. One furnace states that it has 25,000 tons stored in yards, and this may be taken as representative of the condition of almost every interest. So far as can be learned all furnaces are operating, though some of them are obtaining little better than 50 per cent of production. There were few sales of iron during the week, and an increasing hesitancy on the part of furnaces to sell for any delivery. The 4000 tons of foundry sold for first half of 1921 delivery remains in a class by itself, the furnace that took this tonnage having declined any further first half commitment. There is a steady demand for iron and an apparent shortage, particularly in Canada. Canadian consumers are offering \$47, Buffalo, for basic iron, making the price about \$62 delivered in Canada. There does not seem to be any selling even at this figure, the basic furnaces being put to it to get out the tonnage already on their books. A local furnace quoted \$45 on an inquiry for 2000 tons of basic for third quarter de-

livery. To date the transaction has not been closed. Export basic inquiry shows up strongly, there being an aggregate inquiry for about 15,000 tons before the market. Small tonnages of malleable have been sold for last quarter at \$46.25. Prices seem to be very strong and indicate that 1921 iron will be high. There is no reason to suppose at this time that the standard set by a local furnace two weeks ago in selling 1921 foundry at \$45, base, will drop. High coke prices, and strong and increasing demand seem to justify this conclusion.

We quote f.o.b. Buffalo:

| | |
|---------------------------------------|----------------|
| No. 1 Foundry, 2.75 to 3.25 sil..... | \$48.00 |
| No. 2 X foundry, 2.25 to 2.75 sil.... | 46.25 |
| No. 2 plain, 1.75 to 2.25 sil..... | 45.00 |
| Basic | 45.00 |
| Malleable | 46.25 |
| Lake Superior charcoal | 58.00 to 60.00 |

Finished Iron and Steel.—The key to the steel situation in this market is the shipment of material. Cars are very scarce, and while mills are operating very well, they are continuing to pile material. That the steel situation which has its inception in the shortage of cars is beginning to affect industry adversely is shown in the fact that the automobile industry has been so slowed down as to cause many buyers from this trade to request suspension of ordered material and there is limited cancellation of orders. The volume of material so affected is at this time small, but it is the first effect of the slowing of production noticed in this district. There is good demand for bars, wire products, pipe and sheets. Shape and plate inquiry is not so heavy, though there have been a couple of export inquiries for 1000 tons of each. Mills are anxious to take on plate and shape tonnage. One interest which runs heavily on wire material and semi-finished, reports its mills sold ahead seven to eight weeks on all grades. This mill is accepting some wire orders, mostly high-priced specialty material, in 300 to 400-lb. lots, at price prevailing at time of shipment, which is to be made at convenience of mill. Some sheet tonnages have been sold here as high as 9.50c. Generally speaking, there has been no weakening of "intermediate" prices, i.e., those of the independent mills, of conservative policy, but high-priced large mills and some of the smaller independents have brought shape and plate prices to the basis of the "intermediate" mills. Thus they are asking 3.10c. to 3.25c. for shapes and 3.50c. for plates.

Jobbers quote the following prices for this territory: Steel bars, 4.61c.; iron bars, 5.26c.; structurals, 4.46c.; plates, 4.66c.; No. 10 blue annealed sheets, 6.51c.; No. 28 black sheets, 8.25c.; No. 28 galvanized sheets, 9.50c.; bands, 5.81c.; hoops, 6.09c.; cold rolled steel, 6.00c.

Old Material.—Cars are 80 and 90 per cent short of normal, dealers in old material say, and with this condition trading in scrap has been brought to a practical standstill. Dealers cannot recall when the trade was so short of cars as at this time. There is little or no shipping against orders, and it is recognized that this may lead to considerable confusion and possible attempted repudiation of contract. There is a strong demand for heavy melting steel and for some of the lighter grades of material. Efforts are being made by dealers to cover on their obligations in the purchase of 50,000 tons of heavy melting steel. Some difficulty is being experienced by them in obtaining material any lower than \$26, which is the price they are being paid for it.

We quote dealers' asking prices per gross ton, f.o.b. Buffalo as follows:

| | |
|--|--------------------|
| Heavy melting steel, regular grades..... | \$25.00 to \$26.00 |
| Hydraulic compressed | 23.00 to 23.50 |
| Low phos., 0.04 and under..... | 31.50 to 32.50 |
| No. 1 railroad wrought..... | 30.50 to 31.50 |
| No. 1 machinery cast | 37.50 to 38.50 |
| Iron axles | 39.00 |
| Steel axles | 39.00 |
| Car wheels | 37.00 to 38.00 |
| Railroad malleable | 30.50 to 31.50 |
| Machine-shop turnings | 15.00 to 16.00 |
| Heavy axle turnings | 19.50 to 20.50 |
| Clean cast borings..... | 16.50 to 17.50 |
| Iron rail | 29.50 to 30.50 |
| Locomotive grate bars..... | 23.50 to 24.50 |
| Stove plate | 21.50 to 22.50 |
| Wrought pipe | 20.50 to 21.50 |
| No. 1 busheling | 19.50 to 20.50 |
| Bundled sheet stampings | 16.50 to 17.50 |

Birmingham

BIRMINGHAM, ALA., July 20.

Pig Iron.—The stronger tone that entered into the Birmingham iron market with the turn of the half year has maintained since and all sales are made on the base of \$42 with some disposition to look for a still higher price when 1921 business is seriously considered. A few soundings of the 1921 market have been made, usually in the form of asking quotations on fourth quarter coupled with first quarter of the next year. No makers have as yet felt inclined to make such quotations and no 1921 business has been booked. There have been sales of 1000-ton lots for Illinois, Indiana and New England delivery, also for fourth quarter Southern delivery. Speaking of the present status of the iron market, one of the large foundry producers said: "The market is intrinsically and fundamentally strong. The lull in buying that characterized a portion of June gave way with the turn of the half year. Up to the middle of July we had booked more business than we did during the entire month of June. I know of no weak future and look for a brisk fall and winter." The Alabama furnaces pulled through the first month of the coal car priority order without banking a single stack and without halting speed of operations. This is largely due to the proximity of raw materials, the average haul of which is not over 25 miles in the Birmingham district. A comparatively small number of cars does the work of many by reason of the dispatch with which they reach furnaces and are returned for additional loads of ore, coal and limestone. Another advantage lies in the coke rack cars of the Louisville & Nashville, which never leave the district and move shuttle-like between the coking plants and the furnaces and foundries. The main worry is the accumulation of finished iron and steel products. An expert estimates that the total tonnage on sidetracks waiting movement amounts to around 120,000 tons in the Birmingham district alone. A large quantity of this is finished steel products, including cotton ties. Makers are in daily receipt of inquiries for export, but very little of that is accepted and there is very little export iron now remaining on books.

We quote per gross ton, f.o.b. Birmingham district furnaces, the Tennessee company excepted, as follows:

| | |
|---------------------------------|---------|
| Foundry, sil. 1.75 to 2.25..... | \$42.00 |
| Basic | 41.00 |
| Charcoal | 55.00 |

Cast Iron Pipe.—Gastonia, N. C., has sold bonds and is about to finally place order for 1000 tons of water pipe. Industrial interests in Birmingham are in the market for gas pipe tonnage. Both water and sanitary pipe manufacturers agree that the market is more quiet than it has been in some time. Municipalities find it more difficult to float bond issues and building has fallen off in many sections of the country. The new plant of the Talladega Pipe & Fittings Co., Talladega, Ala., has gone into operation. We quote \$73 for 4-in. and \$70 for 6-in. and larger.

Coal and Coke.—Spot 72 hr. foundry coke is strong at a minimum of \$12.50 and runs to \$15 and \$16. Furnace coke sells at \$10 and \$11. All district wants are supplied, but the outside demand is not complied with for lack of coke with which to supply it. Alabama coal output of 1919 has been officially ascertained to have been 15,928,196 tons, compared with 19,521,810 in 1918 and 20,413,811 in 1917. Coke production was 3,667,000 tons, compared with 4,344,000 in 1919. By-product coke production was 2,233,235 tons, or twice that of beehive production. In 1916 by-product production exceeded beehive by fifty per cent. Incident to the increase of by-product capacity this year of 334 ovens, beehive production in 1920 will fall into comparative insignificance. The strikes at domestic mines have spread to one or two small ones of iron producers, but the movement appears to have reached its climax and indications are that it will recede.

Old Material.—The scrap market is in a poor way. The coal car priority order has seriously affected delivery on contracts. Consumers of heavy melting steel appear to be able to dictate prices and no effort yet

made has been able to budge them. Cast remains comparatively active and is very seldom any other way.

We quote per gross ton f.o.b. Birmingham district yards, prices to consumers, as follows:

| | |
|-----------------------------|------------------|
| Steel rails | \$21.00 to 22.00 |
| No. 1 steel..... | 19.00 to 20.00 |
| Cast-iron borings | 14.00 to 15.00 |
| Machine-shop turnings | 14.00 to 15.00 |
| No. 1 cast | 30.00 to 32.00 |
| Car wheels | 28.00 to 30.00 |
| Tramcar wheels | 27.00 to 29.00 |
| Steel axles | 29.00 to 30.00 |
| No. 1 Wrought..... | 20.00 to 22.00 |
| Stove plate | 24.00 to 26.00 |

New York

NEW YORK, July 20.

Pig Iron.—The quotation of \$46, furnace, for the remainder of this year and the first half of next made by a leading Virginia interest received a rather chilly reception, and a very limited tonnage was sold. The company has now withdrawn the quotation so far as this year is concerned, but is still willing to book for the first half of next year. A slightly increased interest in the market for next year is being manifested, and some feelers have been sent out by melters. While furnaces are not anxious to contract for delivery after Jan. 1, several Pennsylvania and at least one Buffalo furnace have named \$46 as their price for the first half of 1921. Some furnaces, preferring to await market developments, are declining to quote at the present time for next year's delivery. Sales during the past week have been of moderate volume, mostly for prompt delivery. One company sold 6000 tons, including some charcoal iron, and 1000 tons of silvery. Export business is extremely dull on account of difficulties connected with foreign shipments. The Covington furnace of the Low Moor Iron Co., which has been out for repairs, will blow in within a few days, and the rebuilt crane stack of the Empire Steel & Iron Co., Catasauqua, Pa., will be blown in next month and will have a capacity of about 450 tons per day. The expected advance of about 18 per cent in freight rates will make an additional heavy handicap on shipments from Southern points, particularly Tennessee and Alabama.

We quote for delivery in New York as follows:

| | |
|--|--------------------|
| East. Pa., No. 1 fdy., sil. 2.75 to 3.25..... | \$50.05 to \$51.05 |
| East. Pa., No. 2X fdy., sil. 2.25 to 2.75..... | 49.05 to 50.05 |
| East. Pa., No. 2 fdy., sil. 1.75 to 2.25..... | 47.80 to 48.80 |
| Buffalo, sil. 1.75 to 2.25..... | 47.90 to 48.90 |
| No. 2X, Virginia, sil. 2.25 to 2.75..... | 50.85 |

Finished Iron and Steel.—There is little or no improvement in the movement of steel by railroad from the Pittsburgh and Youngstown districts. The Eastern steel situation shows virtually no change. There is an absence of large inquiries, most of the current business being in relatively small lots for earliest possible delivery. Aside from plates and shapes, all products remain firm in price. Plates are obtainable from independent mills at from 3.25c. to 3.75c., Pittsburgh, depending on quality, character of specifications, etc., the lower price prevailing only on tank steel, specification plates being quoted at from 3.50c. to 3.75c. Shapes are quoted by independents at from 3.10c. to 3.50c., Pittsburgh. In the structural steel market, there is little activity. Bigelow & Nichols, New York, were low bidders on about 3000 tons of steel for an extension of the Livonia Avenue Elevated, Brooklyn. The Hay Foundry & Iron Works has taken 1500 tons for a building at Fifth Avenue and Fifty-fourth Street, New York. About 500 tons has been let for a building for the Continental Paper Co. Current inquiries include 300 tons for bridges for the New York Central Railroad; 125 tons for a freight house for the Richmond, Fredericksburg & Potomac Railroad at Richmond, Va.; 350 tons for a warehouse for the Petroleum Export Corporation; 400 tons for the Turner Construction Co.; 150 tons for the Southern Railway. The inquiry for 3500 cars for the Elgin, Joliet & Eastern Railroad has been withdrawn.

We quote for mill shipments, New York, as follows: Soft steel bars, 2.62c. to 4.27c.; shapes, 2.72c. to 3.77c.; plates, 2.92c. to 4.02c., the minimum prices being for indefinite delivery and the highest prices for delivery in a few weeks; bar iron, flats, wider than 6 in., 5.97c. to 5.27c. with half extras; light rounds, square and flats, 5.77c. to 6.27c. with full extras, and other sizes, 4.77c. with half extras.

Ferroalloys.—Demand for ferromanganese continues exceedingly light, and sales are confined to small lots for early delivery, for which the quotation continues strong at \$225, delivered. For the last half the quotation is unchanged at \$200, delivered. The only inquiry of consequence is one for 600 tons for delivery at 200 tons per month in August, September and October. The spiegeleisen market continues strong at \$75 furnace, at which level sales in small lots are reported. There are a few inquiries of moderate amounts for fairly early delivery. Caucasian manganese ore has been offered in this market for shipment beginning in September at 80c. per unit, but no sales are reported. There have also been offerings of Indian ore. The market is quoted nominally at 70 to 75c. per unit, seaboard. The 50 per cent ferrosilicon market is quoted unchanged at \$80 to \$85 per ton, delivered.

High Speed Steel.—Domestic producers continue to quote \$1.25 per lb., New York, as the general market price, with imported steel and contracts for large quantities made by some producers at a little less than this price.

Warehouse Business.—Little or no improvement in deliveries is noted. Prices remain practically unchanged. Sheet quotations on page 244 are to a large extent nominal, but are based upon prices charged by most warehouses to customers, when shipments are received from the mills. Few warehouses are able to carry any sheets in stock and those having them obtain more than the quoted price. Although the strike continues in the brass and copper mills, the break in the strike that has occurred at Waterbury, Conn., is felt to be the turning point. Warehouses do not expect anything like normal deliveries for four or five months. We quote prices on page 244.

Cast Iron Pipe.—Inquiries are slightly less, attributed to the realization on the part of would-be purchasers that deliveries would be secured with difficulty, owing to bad transportation. However, manufacturers have all the orders they desire, many being booked for the rest of the year. We quote 6-in. and heavier at \$76.30, New York; 4-in., \$79.30, with \$2 additional for Class A and gas pipe.

Old Material.—The market remains stagnant. There is still considerable talk about export, the volume of which, however, is probably exaggerated because of the large number of dealers involved in one order, who do not realize that they may all be figuring on the same order. One New York broker has raised buying prices slightly over a week ago on five items. We quote a range of \$1 in heavy melting steel because of the higher prices paid in the Pittsburgh district over those in eastern Pennsylvania.

Buying prices per gross ton, New York, follow:

| | |
|---|--------------------|
| Heavy melting steel..... | \$19.50 to \$20.50 |
| Re-rolling rails..... | 33.00 to 34.00 |
| Relaying rails, nominal..... | 52.00 to 54.00 |
| Steel car axles..... | 39.00 to 40.00 |
| Iron car axles..... | 42.00 to 43.00 |
| No. 1 railroad wrought..... | 29.00 to 30.00 |
| Wrought iron track..... | 22.00 to 22.50 |
| Forge fire..... | 13.00 to 13.50 |
| No. 1 yard wrought long..... | 23.50 to 24.00 |
| Light iron..... | 9.00 to 10.00 |
| Cast borings (clean)..... | 16.50 to 17.00 |
| Machine-shop turnings..... | 14.00 to 14.50 |
| Mixed borings and turnings..... | 13.50 to 14.00 |
| Iron and steel pipe (1 in. min. diam., not under 2 ft. long)..... | 17.50 to 18.00 |
| Stove plate..... | 24.00 to 24.50 |
| Locomotive grate bars..... | 26.00 to 27.00 |
| Malleable cast (railroad)..... | 28.00 to 29.00 |
| Old car wheels..... | 36.00 to 37.00 |

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton:

| | |
|--|--------------------|
| No. 1 machinery cast..... | \$38.00 to \$39.00 |
| No. 1 heavy cast (columns, building materials, etc.), cupola size..... | 37.00 to 38.00 |
| No. 1 heavy cast, not cupola size..... | 31.00 to 32.00 |
| No. 2 cast (radiators, cast boilers, etc.)..... | 31.00 to 32.00 |

Refrigerating plants of the multi-cylinder ammonia compressor type, supplied in capacities from ¼ ton to 25 tons' refrigeration and equipped with motor or gas engine drive have been added to its line of gas and air compressors by the Norwalk Iron Works Co., South Norwalk, Conn.

St. Louis

ST. LOUIS, July 20.

Pig Iron.—Somewhat more active buying in small lots and better inquiries were noted during the past week. Some users who have been postponing purchasing in hopes of lower prices now find themselves in urgent need of iron, and are taking on small tonnages to piece out their contracts. Southern furnaces are holding firm, and attempts to buy iron for second half delivery below the \$42 Birmingham base for 1.75 to 2.25 per cent silicon have proved futile. One Southern maker has advanced his price to \$44 for second half of 1920 and first half of 1921 delivery, but iron is being offered at \$42. Melting operations continue at their recent heavy rate, in face of the scarcity of coke.

Coke.—No relief has developed in the record scarcity of coke in this district and in the territory lying to the West. Inquiries deluge dealers and selling agencies here. Prices are tending upward, though many melters in the district declare they have gone as far as they intend to in the matter of tribute to the ovens. The exact price current is difficult to arrive at, as sales have been made in a rather wide range, the maximum figure of which was \$22 ovens for 72-hr. Connellsville coke. The leading by-product interest here, which had done much to relieve the situation, has been obliged to cut its allotments to local industries.

Finished Iron and Steel.—Some slight improvement in stocks has taken place, due to more efficient deliveries from Eastern manufacturers, but the supply is still considerably under demands. Prices hold about steady on standard articles. Tank plates and tubular goods are urgently wanted, and building materials show no decline in popularity. The railroads continue to purchase materials for making urgently needed repairs to their rolling stock. Nails are still at the famine stage in this region.

We quote dealers' prices f.o.b. consumers' works St. Louis industrial district as follows:

For stock out of warehouses we quote as follows: Soft steel bars, 3.94c.; iron bars, 4.50c.; structural material, 4.04c.; tank plates, 4.24c.; No. 10 blue annealed sheets, 7.09c.; No. 28 black annealed sheets, cold rolled one pass, 8.10c.; No. 28 black galvanized sheets, black sheet gage, 9.60c.

Old Material.—The market for scrap iron and steel shows decided strength, though local industries are still out of the running. Dealers are buying and selling among themselves, and sentiment seems to favor still further advances. The strength is based chiefly upon scant offerings from all sources, and the fact that price differentials with other points are at a level permitting the profitable shipment of certain materials. The list of the Missouri, Kansas & Texas Railroad, embracing about 1200 tons, sold at top prices.

Per Gross Ton

| | |
|--|--------------------|
| Old iron rails..... | \$32.00 to \$32.50 |
| Old steel rails, re-rolling..... | 33.00 to 33.50 |
| Old steel rails, less than 3 ft..... | 23.00 to 23.50 |
| Relaying rails, standard sections subject to inspection..... | 50.00 to 55.00 |
| Old car wheels..... | 35.00 to 35.50 |
| No. 1 railroad heavy melting steel..... | 22.00 to 22.50 |
| Heavy shoveling steel..... | 21.00 to 21.50 |
| Ordinary shoveling steel..... | 20.50 to 21.00 |
| Frogs, switches and guards, cut apart..... | 24.00 to 24.50 |
| Ordinary bundled sheets..... | 12.00 to 12.50 |

Per Net Ton

| | |
|--|--------------------|
| Heavy axles and tire turnings..... | \$12.50 to \$13.00 |
| Iron angle bars..... | 27.00 to 27.50 |
| Steel angle bars..... | 21.00 to 21.50 |
| Iron car axles..... | 39.00 to 39.50 |
| Steel car axles..... | 32.50 to 33.00 |
| Wrought arch bars and transoms..... | 31.00 to 31.50 |
| No. 1 railroad wrought..... | 24.00 to 24.50 |
| No. 2 railroad wrought..... | 22.00 to 22.50 |
| Railroad springs..... | 21.00 to 21.50 |
| Steel couplers and knuckles..... | 22.00 to 22.50 |
| Locomotive tires, 42 in. and over smooth inside..... | 21.00 to 21.50 |
| Cast-iron borings..... | 13.00 to 13.50 |
| No. 1 busheling..... | 19.00 to 19.50 |
| No. 1 boiler, cut to sheets and rings..... | 15.00 to 15.50 |
| No. 1 railroad cast..... | 34.00 to 34.50 |
| Stove plate and light cast..... | 26.50 to 27.00 |
| Railroad malleable..... | 24.50 to 25.00 |
| Agricultural malleable..... | 24.00 to 24.50 |
| Pipes and flues..... | 17.00 to 17.50 |
| Heavy railroad sheet and tank..... | 15.00 to 15.50 |
| Railroad grate bars..... | 26.00 to 26.50 |
| Machine-shop turnings..... | 11.50 to 12.00 |
| Country mixed..... | 17.00 to 17.50 |
| Uncut railroad mixed..... | 20.00 to 20.50 |
| Horseshoes..... | 25.00 to 25.50 |

Cincinnati

CINCINNATI, July 20.

Pig Iron.—While the market cannot be termed active, more inquiries are being received than has been the case for many weeks. Most of these are for fill in tonnages for prompt delivery and range all the way from carload lots to 500 tons. The aggregate of all inquiries now before the trade probably would be 15,000 tons, and included in this is one from an Indiana melter for 6,000 tons of foundry for shipment during this half, and several of 1,000 tons each from melters in the south. The first sale reported for first half of next year was made last week when a local melter purchased 500 tons of Southern foundry iron on a \$42, Birmingham, basis. The furnace making the sale is the only one in that district that has quoted for this delivery and several inquiries referred to others have brought the reply that no quotations will be made until a later date. The Virginia Iron, Coal & Coke Co.'s intimation that it will accept business for first half of 1921 on a \$46 base has not so far met with any response from this district and no sales are reported. About 5,000 tons of iron was disposed of in this territory during the week, including one of 1,200 tons of Southern foundry. The 5,000 tons of malleable inquired for by a Kokomo, Ind., melter, is understood to have been split up between two Southern Ohio furnaces, each getting 2,500 tons. The price in each case was reported to be \$46.25, furnace. A northern Ohio steel plant is inquiring for 3,000 tons of basic, and a local agency reports a sale of 7,000 tons in the Pittsburgh district at \$46, Valley furnace. A sale of 200 tons of 10 per cent silvery is reported at \$62.50, Jackson County furnace, and 150 tons of spiegeleisen at \$75.

Based on freight rates of \$3.60 from Birmingham and \$1.80 from Ironton, we quote f.o.b. Cincinnati:

| | |
|---|------------------|
| Southern coke, sil. 1.75 to 2.25 (base price) | \$45.60 |
| Southern coke, sil. 2.25 to 2.75 (No. 2 soft) | 46.85 |
| Ohio silvery, 8 per cent sil. | 59.80 |
| Southern Ohio coke, sil. 1.75 to 2.25 (No. 2) | 46.80 |
| Basic Northern | 44.80 |
| Malleable | \$45.80 to 46.80 |

Finished Material.—The demand for finished materials is reported easier, the explanation given by selling agencies being that buyers have come to the conclusion that with transportation conditions prevailing they would have no guarantee that they would be able to secure the materials. Inquiry for sheets is not so heavy as in recent weeks, and consumers report that several mills are inclined to take on business for the fourth quarter at prices under what they are quoting to-day. The blockade at the mills is beginning to make itself felt locally, and one consumer is now trucking materials from a mill in the Valley to a town 100 miles away, where he is able to secure an occasional car in which to ship to this city. Local warehouses report business is brisk, and as a consequence stocks are badly depleted. One jobber reports that he is now running with about 30 per cent of the stock carried in normal times. For 30 to 60 days' delivery several independent mills are quoting 4.04c., Pittsburgh, for steel bars, and 4c. on shapes and plates. Independent mills are quoting black sheets at from 7.75c. to 8.25c., and galvanized from 8 to 9c. There is a marked scarcity of semi-finished nuts and the smaller sizes of machine bolts, while screws are almost off the market. Some shipments of wire nails were received during the week, but the demand is still heavy. No structural lettings are reported, and the only inquiries developing from this district were about 150 tons for a crane runway for the Pollak Steel Co.'s Marion plant, and a small tonnage for bridge replacements for the Big Four. Warehouse prices remain unchanged from those prevailing during the past six weeks, and are as follows:

Iron and steel bars, 5c. to 6c.; structural shapes, 4.50c.; plates, 4.50c.; cold rolled shafting, 6.25c.; steel bands, 4c.; No. 10 blue annealed sheets, 7.50c.; No. 28 black sheets, 9 to 10c.; No. 28 galvanized sheets, 10c. to 11c.; wire nails, \$4.50 per keg base.

Tool Steel.—The market is quiet, due in great meas-

ure to the fact that a number of the shops in this city are operating short-handed on account of a machinists' strike. Prices are firm, high-speed steel being quoted at \$1.25 per lb.

Coke.—Connellsville coke in car load lots was sold in this district last week at \$20. Operators are quoting \$17 to \$19 for furnace and \$18 to \$20 for foundry with the majority of the sales being made at \$18.50. No quotations are being received from the Wise County and New River fields, as it is understood no coke is available there.

Old Material.—In the scrap market, more inquiries are being received for the steel grades and there is a stronger tone apparent all around. Lack of transportation facilities is the chief handicap the market has to contend with and when this is overcome, dealers look for higher prices. The Norfolk & Western Railroad is offering a considerable tonnage of scrap and the B. & O. list is still active. Prices with the exception of machinery cast, which some dealers have reduced \$1 a ton, remain unchanged.

We quote dealers' buying prices:

| | Per Gross Ton | |
|--|--------------------|--|
| Bundled sheets | \$14.00 to \$15.00 | |
| Old iron rails | 27.00 to 28.00 | |
| Relaying rails, 50 lb. and up | 50.00 to 51.00 | |
| Re-rolling steel rails | 31.00 to 32.00 | |
| Heavy melting steel | 21.50 to 22.50 | |
| Steel rails for melting | 24.00 to 25.00 | |
| Car wheels | 29.00 to 30.00 | |
| | Per Net Ton | |
| No. 1 railroad wrought | \$25.00 to \$26.00 | |
| Cast borings | 11.50 to 12.00 | |
| Steel turnings | 9.50 to 10.00 | |
| Railroad cast | 31.00 to 32.00 | |
| No. 1 machinery | 35.00 to 36.00 | |
| Burnt scrap | 22.00 to 23.00 | |
| Iron axles | 29.50 to 30.00 | |
| Locomotive tires (smooth inside) | 23.50 to 24.50 | |
| Pipes and flues | 16.00 to 16.50 | |
| Malleable cast | 23.00 to 23.50 | |
| Railroad tank and sheet | 16.00 to 16.50 | |

Cleveland

CLEVELAND, July 20.

Iron Ore.—Furnaces are urging ore firms to ship ore as fast as possible in order to get as much in their yards as they can before the advance in freight rates which is expected to go into effect around Sept. 1. However, the supply of cars shows no improvement and Monday there were about 80 boats laid up at Lake Erie ports waiting to unload. Ore shipments are being unevenly distributed. Some furnaces are getting a good supply and others are receiving very little. The market is inactive, although a small tonnage of resale ore was disposed of during the week. However, furnaces as a rule want all the ore they have purchased. That there have been practically no cancellations of ore resulting from the slowing down of furnace operations because of the fuel situation is attributed to the fact that most furnaces in their purchases of ore early in the season did not cover for the entire quantity they expected to need.

We quote delivered lower Lake ports: Old range Bessemer, \$7.45; old range non-Bessemer, \$6.70; Mesaba Bessemer, \$7.20; Mesaba non-Bessemer, \$6.55.

Pig Iron.—A number of additional inquiries have come out for foundry pig iron for delivery next year and one northern Ohio furnace is quoting on several lots aggregating 2,000 to 3,000 tons on the basis of \$44 for 1.75 to 2.25 silicon iron or the same price as it is quoting for this year. It is expected that some of this business will be definitely placed within a day or two. One sale of 600 tons for the first half is reported to a western Ohio stove manufacturer. There is an active demand for prompt shipment iron for consumers that are not getting full shipments from their regular sources of supply. A southern Ohio interest has advanced its price to \$50.25 for 1.75 to 2.25 silicon iron. One car lot sale is reported on that basis and the same producer has sold a small tonnage of malleable iron to a Cleveland consumer at \$50.25 for early shipment. The Westinghouse Electric & Mfg. Co. has purchased 500 tons of 1.75 to 2.25 silicon iron for its Cleveland plant from a Valley furnace at \$45 and 500 tons of Virginia iron 2.25 to 2.75 silicon at \$45.25, both for early shipment. The Kokomo, Ind., interest that inquired for 5,000 tons of malleable iron

for last quarter has placed 4,000 tons with a southern Ohio furnace. A northern Indiana implement manufacturer is inquiring for 6,000 tons of foundry iron for last half and one furnace that has been supplying this consumer was unable to take on this tonnage. A Canton, Ohio, foundry is inquiring for 500 tons for the third quarter. One northern Ohio furnace reports sales during the week aggregating 1,500 tons. The Ford Motor Co., Detroit, is offering a limited amount of pig iron for sale from its Detroit furnace for rather early delivery. This is in addition to the resale iron that this company has recently placed on the market. We note the sale of 500 tons of Ohio silvery iron for the third quarter and 350 tons for delivery during the remainder of the year at \$58 for 8 per cent. All producers are apparently now adhering to this price. Some of the producers report that they were unable to ship as much pig iron last week as during the few previous weeks owing to the scarcity of the car supply. A local furnace interest was able to ship only half of its make. Considerable Buffalo iron is being shipped east by barges. Many foundries are asking furnaces to anticipate shipments in order to get their iron in stock before the advance in freight rates.

We quote delivered Cleveland as follows, based on 40c. switching charge for local iron, a \$1.40 freight rate from Valley points, and \$5 from Birmingham:

| | |
|---|----------------|
| Basic | \$46.40 |
| Northern, No. 2 fdy., sil. 1.75 to 2.25 | 45.40 |
| Southern foundry, sil. 2.25 to 2.75 | 48.70 |
| Gray forge | 41.40 |
| Ohio silvery, sil. 8 per cent. | 60.40 |
| Standard low phos., Valley furnace. | 54.00 to 55.00 |

Coke.—Foundry coke for prompt shipment is quoted at \$18 to \$18.50 for standard Connellsville, but very little is being offered. The demand is light. Shipments on contracts are still very low.

Semi-Finished Steel.—While the steel billet and sheet bar market is easier, the local mill this week sold 1000 tons of open-hearth billets for prompt shipment at \$70, and we also note the sale of close to 1000 tons at the same price by a Pittsburgh mill. Sheet bars are inactive and some sheet mills, owing to a reduction in operations, are not taking their regular quotas on contracts. Forging billets have sold at \$75 in this market recently, but this price may be withdrawn.

Finished Iron and Steel.—The transportation situation as it affects the movement of steel is apparently worse than it has been. Shipments from Pittsburgh mills to this territory are fully as bad as at any time and some other mills that have been making shipments fairly well are now suffering from lack of cars. Shipments from Cleveland are very slow except in the direction of the coal mines. Demand for most finished lines is light. There is very little inquiry for contracts, and most orders that are being placed are accompanied by specifications, as consumers are buying only to cover early requirements. Some business is still coming from makers of automobile parts, but the slowing up of this industry is indicated by the size of the orders. Steel bars are in fair demand, and mills able to make early shipments are still making sales at 4c. Plates are generally quoted at 3.50c., but a local mill continues to book small lots at 3.75c. to 4c. An additional order for 600 tons has been placed for tank cars. The only demand for structural material is coming from crane builders, car builders, tractor plants and other manufacturers. Fabricating shops have very little building work on hand and there is no indication of a revival of the building industry. Some fabricating shops have not yet taken all the steel purchased for their expected second quarter requirements. Among inquiries pending is one for 3000 tons of wire or wire rods. Reinforcing bars are quiet, but one mill is still able to make sales at 4c. owing to the fact that the mills naming lower prices are unable to make as good deliveries. There is an improved demand from coal mining companies for light rails.

Sheets.—The sheet market is fairly active, but no round tonnages are being placed and there have been some suspensions and cancellations in the automobile field. While quotations of 5.50c. for blue annealed sheets and 5c. for heavier gages are reported, local mills continue to take orders at 6c. to 6.25c. for No. 10 and at 7.50c. to 8c. for No. 28 black. Automobile body sheets are unchanged at 7.85c.

Cleveland warehouses quote steel bars at 3.27c. to 4.50c.; plates, 3.57c. to 5c., and structural material, 3.70c. to 4.50c.; No. 9 galvanized wire, 4.70c.; No. 9 annealed wire, 4c.; No. 28 black sheets, 8.50c.; No. 28 galvanized, 9.50c.

Bolts, Nuts and Rivets.—There is a good demand for bolts and nuts for prompt shipment and considerable inquiry for third quarter contracts although some manufacturers now have about all their trade under contract for that delivery.

Old Material.—One large local consumer that has not been buying scrap for some time is again in the market and is reported to be offering \$24 to \$24.50 for heavy melting steel and \$15 for shoveling turnings. Another northern Ohio mill is still buying heavy steel scrap. There is more activity among dealers than there has been recently, but some of their purchases are of a speculative character. The market is firm on most grades. Heavy melting steel and turnings are 25c. a ton higher and drop forge flashings have been marked up \$1 a ton. Railroad malleable scrap is scarce and higher. Busheling is inactive and weak. A local mill is offering \$17.50 to \$17.75 for this grade. Many of the yard dealers are holding their scrap for prices considerably higher than are prevailing at present.

Dealers quote delivered consumers' yards in Cleveland and vicinity as follows:

| | |
|--|--------------------|
| Heavy melting steel..... | \$24.50 to \$25.00 |
| Steel rails, under 3 ft..... | 27.50 to 28.00 |
| Steel rails, rerolling..... | 31.00 to 32.00 |
| Iron rails | 32.00 to 33.00 |
| Iron car axles..... | 41.00 to 42.00 |
| Steel car axles..... | 36.00 to 37.00 |
| Low phos. melting scrap..... | 26.50 to 27.00 |
| Cast borings | 15.75 to 16.00 |
| Machine shop turnings..... | 12.00 to 12.50 |
| Mixed borings and short turnings..... | 15.75 to 16.00 |
| Short turnings for blast furnaces..... | 15.75 to 16.00 |
| Compressed steel | 19.50 to 20.00 |
| Railroad wrought | 28.00 to 29.00 |
| Railroad malleable | 32.50 to 33.00 |
| Steel axle turnings | 19.50 to 20.00 |
| Light bundle sheet scrap..... | 14.00 to 14.25 |
| Drop forge flashings over 10 in..... | 18.50 to 19.00 |
| Drop forge flashings under 10 in..... | 18.50 to 19.00 |
| No. 1 cast..... | 41.00 to 42.00 |
| No. 1 busheling..... | 17.50 to 17.75 |
| Railroad grate bars..... | 32.00 to 33.00 |
| Stove plate | 32.00 to 33.00 |
| Cast-iron wheels | 37.00 to 38.00 |
| Pipes and flues..... | 23.50 to 24.00 |

Philadelphia

PHILADELPHIA, July 20.

Pig Iron.—Two lots of basic pig iron of 2000 tons each were sold in the past week by an Eastern furnace company to Eastern consumers at \$43, furnace. Delivery is to be made during third quarter. An Eastern steel casting company has purchased about 1000 tons of low phosphorus iron and about 500 tons of Bessemer iron. Another sale of 400 tons of high sulphur malleable iron at \$47.50, furnace, is reported. In foundry iron there is some inquiry, but consumers are mainly concerned in getting shipments of iron already contracted for. The shipping situation shows little or no improvement, and some merchant furnaces in the East are piling iron. Eastern Pennsylvania furnaces are generally quoting foundry iron at from \$46 to \$48 base, furnace, for 1.75 to 2.25 per cent silicon, with usual differentials for higher silicon. The leading Virginia maker of foundry iron, which came into the market about two weeks ago for second half and first half of 1921 at \$46, furnace, has withdrawn from the market for second half, but will continue to sell for delivery in first half of next year. Other Virginia furnaces are quoting last half iron on the basis of \$45, furnace. The coke shortage is crucial, and unless there is improvement soon, more furnaces will be banked. Up to \$19 and \$20 have been obtained for furnace coke for prompt shipment, and like prices prevail on foundry coke.

The following quotations are for iron delivered in consumers' yards in Philadelphia or vicinity, except those for low phosphorus iron, which are f.o.b. furnace:

| | |
|---|--------------------|
| East. Pa. No. 2 plain, 1.75 to 2.25 sil. | \$46.90 to \$49.10 |
| East. Pa. No. 2 X, 2.25 to 2.75 sil. | 48.15 to 50.35 |
| Virginia No. 2 plain, 1.75 to 2.25 sil. | 49.10 to 50.10 |
| Virginia No. 2 X, 2.25 to 2.75 sil. | 50.35 to 51.35 |
| Basic deliv. eastern Pa. | 44.40 to 44.80 |
| Gray forge | 43.00 to 44.00 |
| Standard low phos. (f.o.b. furnace) | 54.00 |
| Malleable | 48.10 to 48.60 |
| Copper bearing low phos. (f.o.b. furnace) | 53.00 to 55.00 |

Ferroalloys.—A sale of 200 tons of 76 to 80 per cent ferromanganese at \$200, delivered, for shipment over second half is reported. Inquiry is light. There is some cutting of prices, but makers say that this is on resale metal. The Marietta furnace of the Lavino Furnace Co. will be lighted this week, and with this addition all four furnaces of this interest will be making ferromanganese. There is little demand for spiegel-eisen, but the market is holding firm at \$75, furnace.

Semi-Finished Steel.—Prices of billets are slightly easier, it now being possible to obtain open-hearth re-rolling billets at \$60, Pittsburgh, or slightly less. There is little demand for forging billets, due to the fact that business in the forging industry has fallen off decidedly in the past 30 or 60 days, but \$75 to \$80, Pittsburgh, is quoted.

Plates.—A slightly better inquiry for plates is reported by sellers. One company states that it has inquiries for ship steel amounting to 10,000 tons in one instance and 16,000 tons in another. Most of the current inquiries, however, are for small lots for early delivery. The Pennsylvania Railroad is reported to have closed with two mills for a total of 2500 tons of 3/16 in. plates for car repairs. The price is said to have been 3.50c., Pittsburgh, subject to extra. The plate market is quotable at from 3.25c. to 3.75c., Pittsburgh, from independent mills, which are the only sources of supply able to make early delivery. The lower quotation applies only to tank steel, but on a majority of transactions even in this grade 3.50c. has been obtained. Specification plates are frequently quoted as high as 3.75c., Pittsburgh, sales having been made at this price in the past week.

Structural Material.—With no building activity worthy of note, the demand for shapes shows no improvement. Eastern mills are not producing at much more than 50 per cent of normal. Prices quoted by independents range from 3.10c. to 3.50c. The minimum price is named by only one mill, so far as reported, but 3.25c., Pittsburgh, is quoted by two or more of the Eastern independents.

Bars.—A good demand for bar products continues. One producer has so far this month booked 10,000 tons more than it has shipped. We note the sale of 1000 tons of band steel at 5c., Pittsburgh, and 500 tons of spring steel at 4.50c., Pittsburgh. Bar iron is in fair demand, with prices unchanged, 4.50c., base, Pittsburgh, being named by most of the larger producers. Production of bar iron is hampered by strikes at two Eastern plants.

Old Material.—There is so little business in scrap that quotations are nominal. In heavy melting steel there is some buying for export and for shipment to the Pittsburgh district, but Eastern steel makers are not in the market. Cast iron scrap is in fair demand and prices are firmer, which is in contrast to other grades of scrap. We quote for delivery at consumers' works in this district as follows:

| | |
|---|--------------------|
| No. 1 heavy melting steel..... | \$22.50 to \$23.00 |
| Steel rails re-rolling..... | 32.00 to 33.00 |
| No. 1 low phos., heavy 0.04 and under | 30.00 to 31.00 |
| Car wheels..... | 38.00 to 40.00 |
| No. 1 railroad wrought..... | 33.00 to 34.00 |
| No. 1 yard wrought..... | 26.00 to 27.00 |
| No. 1 forge fire..... | 17.50 to 18.00 |
| Bundled skeleton..... | 17.50 to 18.00 |
| No. 1 busheling..... | 20.00 to 21.00 |
| No. 2 busheling..... | 17.00 to 18.00 |
| Turnings (short shoveling grade for blast furnace use)..... | 17.00 to 18.00 |
| Mixed borings and turnings (for blast furnace use)..... | 16.50 to 17.50 |
| Machine-shop turnings (for rolling mill and steel works use)..... | 18.50 to 19.00 |
| Heavy axle turnings (or equivalent) | 20.00 to 20.50 |
| Cast borings (for rolling mills)..... | 20.00 to 21.00 |
| Cast borings (for chemical plants)..... | 21.50 to 22.50 |
| No. 1 cast..... | 38.00 to 40.00 |
| Railroad grate bars..... | 30.00 to 31.00 |
| Stove plate (for steel plant use)..... | 27.50 to 28.50 |
| Railroad malleable..... | 28.00 to 29.00 |
| Wrought iron and soft steel pipes and tubes (new specifications)..... | 21.00 to 22.00 |
| Iron car axles..... | 45.00 to 46.00 |
| Steel car axles..... | 42.00 to 44.00 |

The Brightwood Foundry Co., Springfield, Mass., is building a one-story and basement, 52 x 73 ft. addition to its foundry, and the Davitt Foundry Co. of that city, is making some changes at its plant.

British Prices Receding

American Offerings at Competitive Figures—Increased Transportation Rates May Reduce Pig Iron Output

(By Cable)

LONDON, ENGLAND, July 19.

The production of Cleveland pig iron is disturbed by proposed increases in transportation rates and the insertion of covering clauses in contracts. Scotch demand is easier on account of the holidays, but exports are still banned. Dorman, Long & Co. have started a large new furnace. Business in hematite iron is still difficult, domestic demands requiring all available supplies. As a result exports are neglected. Rubio ore is quoted at 55s. 6d., ex-ship, Tees.

Steel makers are more inclined to quote on heavy plates, but other products are still difficult to obtain. There are further heavy cancellations of ships. The Welsh steel market is weak, with bar makers desiring orders. Tin plate and sheet bars are quoted at £24, and could be obtained for possibly less. American offerings of finished and semi-finished material continue at competitive figures. There have been further arrivals of Australian billets and wire rods.

The tin-plate market is flat, prompt delivery having been sold at 63s., basis. America is offering 28 x 20's at 120s., c.i.f. prompt arrival. In the wage dispute Welsh makers have agreed to add 25 per cent of special bonus to the base rate and 25 per cent of special and all war bonuses to be made on this amended base rate, taking effect on July 4, pending a decision on the sliding scale, extra manning being agreed to where extra men are obtainable, while tonnage payments and the 6-hr. shift are to be discussed later. There is to be a holiday of one week only. The galvanized sheet market is weak, with makers asking £52, f.o.b.

We quote per gross ton except when otherwise stated, f.o.b. maker's works, with American equivalent figured at \$3.84 for £1 against \$3.94 a week ago, as follows:

| | | |
|---|---------------|---------------------|
| Ship plates..... | 26 0 to 34 0 | \$99.84 to \$130.56 |
| Boiler plates..... | 28 10 to 37 0 | 109.44 to 142.08 |
| Tees..... | 20 10 to 33 0 | 78.72 to 126.72 |
| Channels..... | 25 15 to 33 5 | 98.88 to 127.68 |
| Beams..... | 25 10 to 32 0 | 97.92 to 122.88 |
| Round bars, 3/4 to 3 in..... | 28 0 to 33 10 | 107.52 to 128.64 |
| Rails, 60 lb. and up..... | 23 0 to 25 0 | 88.32 to 96.00 |
| Billets..... | 25 0 to 26 0 | 96.00 to 99.84 |
| Sheet and tin plate bars, Welsh..... | 23 0 to 24 0 | 88.32 to 92.16 |
| Galvanized sheets, 24 g..... | 52 0 to 53 0 | 199.68 to 203.52 |
| Black sheet, 24 g. to 26 g..... | 50 0 to 54 0 | 192.00 to 207.36 |
| Tin plate, base box..... | 3 3 | 12.09 |
| Steel hoops..... | 38 15 to 39 0 | 148.80 to 149.76 |
| Cleveland basic iron..... | 11 7 1/2 | 43.68 |
| West Coast hematite..... | 14 15 | 56.64 |
| Cleveland No. 3 foundry (export to allies)..... | 10 5 | 39.36 |
| Ferromanganese..... | 35 0 to 40 0 | 134.40 to 153.60 |
| Coke..... | 3 2 3/4 | 12.04 |

*Prompt delivery: for Aug.-Sept., 61s. (\$11.71); last quarter, 59s. (\$11.32).

Maintenance of High Prices Not Expected—Coke Supply Better—Pig Iron Market Tight

LONDON, ENGLAND, July 3.—There is not much business moving in foreign ore. Consumers appear to be comfortably situated. Meanwhile, freights appear to be tending downward and the price of best Bilbao rubio, 50 per cent, is now around 58s. per ton, ex-ship Tees. The supplies of coke seem to be coming forward better and to be more adequate to current needs. Good medium furnace kinds are very firm.

As regards pig iron, the Cleveland market has remained very steady with an excellent demand, while the home trade requirements are sufficient to absorb all the output. The tendency is, of course, towards increased production but the position in this respect is

slow to improve, and in fact has been recently adversely affected by the closing down for repairs of the Two-Bridge Iron Works of Messrs. Pease & Partners, Ltd. It is stated that this involves a loss for three months of at least two furnaces on Cleveland pig iron. Of course, the two furnaces in question are old and the production relatively small but the loss will be nevertheless severely felt. It would appear as if conditions, nevertheless, during the next month or two might be somewhat easier, so far as home trade is concerned, owing to the approach of the holiday period. With works closed, deliveries will have to be suspended. At present export business has to be completely neglected, owing to the shortage of supplies, but it must be admitted at the same time that buyers abroad are not now so keen, being apparently chary of committing themselves at present figures.

While the foregoing remarks apply to Cleveland iron, it may also be said that business in hematite iron is also difficult to work for the same reason, shortage of supplies. The exports of pig iron from Middlesbrough during June amounted to 56,159 tons, compared with 31,913 tons in May, an increase of 24,246 tons. The increase is accounted for by the stoppage of shipments during 10 days in May, owing to the dockers' strike.

In finished iron and steel there is a growing belief that prices cannot be maintained for any lengthy period at present levels and this is responsible for the holding back of a great many orders. Buyers seem to expect that the tighter financial conditions will eventually cause makers to lower their prices, while in some directions it is believed that the time is approaching when foreign competition must be met. As a consequence, manufacturers have become somewhat anxious regarding new business, although no real decline in prices has been seen yet. It is noticed, however, that inquiries are now being considered, where but a short time ago they were ruthlessly turned down.

Consumers of shipbuilding steel are pressing hard for deliveries. There have also been certain inquiries from overseas. During June, the Clyde shipyards launched 12 vessels of 33,350 tons. This brings the total for the first half of the year up to 271,363 tons, compared with 263,451 tons for the first six months of last year.

It is reported that Messrs. Guest, Keen & Nettlefold intend to erect on the Ivor site important ranges of coke-ovens for the complete supply of the company's Dowlais works and an electric power station for the works and collieries, and to manufacture all machinery required for use at works and collieries. It is also reported that a large area of ground is being prepared at Ivor for the erection of fitting-shops. It is believed that the scheme will entail an expenditure of £750,000.

An announcement which naturally aroused a considerable amount of interest was made by the Northumberland Shipbuilding Co. to the effect that in view of the decision to increase the excess profits duty to 60 per cent, it will be impossible to carry out the offer made on their behalf by Messrs. Sperling & Co. to purchase the shares in Baldwins, Ltd., the well-known iron and steel manufacturers. The contention of the Northumberland company is that the contract was entered into on the basis that the excess profits duty would be removed, but instead of this it is proposed that it should be increased; and this fact has rendered the carrying out of the original contract for the purchase of the shares impossible. Negotiations apparently have been proceeding between the directors of the company and the directors of Baldwins with a view to arriving at some modification of the original contract, but so far these have been unsuccessful. It is understood that an action has been started by six different shareholders of Messrs. Baldwins against Messrs. Sperling & Co., claiming £3 per share, the amount originally offered, and asking alternatively for specific performance and other relief.

The plant of the Scranton Nut & Bolt Co., Scranton, Pa., shut down because of lack of soft coal.

IRON AND INDUSTRIAL STOCKS

Prices Seesaw Back and Forth Within a Comparatively Small Range

The market for iron and industrial stocks continues to seesaw back and forth within a comparatively narrow range, really getting nowhere when averages are taken into consideration. Public buying of securities is relatively smaller than it has been for months. Consequently daily quotations are governed to a large extent by the so-called professional trading element.

Money market conditions are largely accountable for stock market conditions to-day. The money situation fundamentally is slightly better, but it is difficult for industry to secure all the money it wants and the fact coupled with the transportation and labor phase tends to slow up the movement of finished products into consumptive hands. The fact that the United States Rubber Co. is obliged to pay 7½ per cent for \$20,000,000 over a period of 10 years is significant, but the income yields on Liberty and steel company bonds is more so.

| | | | |
|-------------------|-----------|--------------------|----------|
| Allis-Chalm. com. | 35½-37½ | Int. Har. com. | 127-129 |
| Am. Can com. | 38½-41½ | Lackawanna Stl. | 72-77 |
| Am. Can pf. | — 90 | Midvale Steel | 40½-42½ |
| Am. C. & F. com. | 133½-138½ | Nat.-Acme | — 34½ |
| Am. C. & F. pf. | 106½-107½ | N. Y. Air Brake | 97-100 |
| Am. Loco. com. | 95½-101½ | Nova Scotia Steel | 52½-54 |
| Am. Loco. pf. | — 99½ | Press. Steel com. | 97-100½ |
| Am. Ship com. | 23½-24 | Press. Steel pf. | — 97 |
| Am. Steel F. com. | 37½-38½ | Ry. Stl. Spg. com. | 96-96½ |
| Am. Steel F. pf. | — 87½ | Replodge Steel | 81½-86½ |
| Bald. Loco. com. | 114½-121½ | Republic com. | 88½-94½ |
| Bald. Loco. pf. | — 97½ | Republic pf. | — 96 |
| Beth. Steel com. | 85½-87 | Sloss com. | 69½-74½ |
| Beth. Stl. Cl. B. | 87½-90 | Superior Steel | 50-51 |
| Beth. Stl. 8% pf. | 105½-106½ | Transue-Williams | — 51 |
| Case, J. L. pf. | — 14 | Un. Alloy Steel | 42½-43 |
| Chic. Pneu. Tool. | 87-90 | U. S. Pipe com. | — 17 |
| Colorado Fuel | 31¼-34 | U. S. Steel com. | 90¼-93¼ |
| Cruc. Steel com. | 142½-156 | U. S. Steel pf. | 107½-108 |
| Cruc. Steel pf. | — 93 | Vanadium Steel | 82½-87½ |
| General Electric | 141¼-143½ | Va. I. C. & Coke | 110-112 |
| Gt. No. Ore Cert. | 35-35½ | Westingh'se Elec. | 48¼-49½ |
| Gulf States Steel | 58½-60½ | | |

Conditions in the Fabricating Trade

A representative of the fabricating industry, whose sources of information are of the best, referring to the fact that June business was smaller than that of any previous month in the year, attributes the falling off in part to the unfavorable conditions in transportation, and in part to the further restriction of credits. Structural shops have had to resort to unusual means of getting raw material into and fabricated material out of their plants. The shortage of cars has been pronounced. In many cases the bulk of the shipments out were made in cars unloaded at fabricating works.

From the beginning of the year industrial plant extensions have figured very largely in the orders taken by fabricators. In June the bridge work on which bids were asked, both for railroads and highways, was considerably less than 10 per cent of the total. Now there has come the much more restrictive policy of the banks regarding industrial extensions, and thus the shrinkage in new work has been accentuated. The indications are that industrial construction will be a small factor in the remainder of the year.

Improved labor conditions are indicated by the fact that in June a number of structural plants were able to get a larger output than in May, and the May output in turn was somewhat larger than that of April. The individual workman, as in some other metal-working industries, is evidently producing more. The unfinished tonnage on the books of fabricators is probably less to-day than was the case one month ago, cancellations being in part the cause. A good many plants had the equivalent of four months' work ahead on June 1, whereas the average was three and a half months' work ahead on July 1. The amount of work on which figures are being taken has been decreasing of late.

BOOK REVIEWS

The Making, Shaping and Treating of Steel. By J. M. Camp and C. B. Francis. Pages 614, 5 x 7½ in.; illustrations, 122. Published by the Carnegie Steel Co. Bureau of Instruction, Pittsburgh.

The appearance of this book is an event of first-class importance in the making of a literature of American steel works practice. It may be said safely that it contains more concerning the most recent developments in the manufacture and treatment of steel than any other volume extant. Mr. Camp, before he took charge of the Carnegie Steel Co.'s Bureau of Instruction, was well known as chief chemist of the company, and as the editor of a considerable pamphlet containing the methods of chemical analysis for iron and steel which were developed for use by the Carnegie Steel Co. and other subsidiaries of the United States Steel Corporation. The book that has just come from the press is referred to in its preface as "the outcome of several years' experience in attempting to teach the metallurgy of steel to our salesmen and other non-technical employees." The method which has been followed for some years under Mr. Camp's direction has been that of taking the students into the mills for first hand information and then supplementing the knowledge gained from these visits by explanatory lectures delivered in a class room. The lectures in a condensed form have been circulated in the Carnegie organization. There was a wide demand for them, and they have been revised and enlarged and the book is the result.

There are excellent works on the metallurgy of iron and steel and its development in the practice of this country. Prof. Henry M. Howe's great contribution to the industry will be thought of first in this connection. In later years comes Stoughton's book, and in blast furnace practice the authorship of Forsythe and Johnson is outstanding. The collaboration of Harbord and Hall, the former dealing with the metallurgy and the latter with the mechanical treatment of iron and steel, gave two volumes that have been conspicuous for giving more concerning American practice than any other British publication, but they would require heroic revision to bring them up to date.

The chapters on blast furnace practice, which follow an excellent treatment of iron ores and fuels covering about 90 pages, bear out what some noteworthy papers before the American Iron and Steel Institute have been indicating as to the lines of progress in blast furnace construction and operation in the past six or eight years. In blast furnace construction the general features of recent tendencies are the vertical rising of the lower in-wall for several feet, the making of steeper boshes and the dropping of the upper in-wall vertically for about 10 ft. from the stock line. The angle at the top of the bosh which its wall forms with a horizontal from the center of the furnace, it is shown, has been increased from about 75 deg. to 80 deg., and these steeper boshes have been an important improvement along with the concentration of heat in the tuyere region.

The manufacture of steel in electric furnaces takes up about 50 pages in which the developments in that direction are discussed with plentiful illustration and the detail of typical heats. The duplex process and its advantages and disadvantages are well summarized and the features of Southern practice in duplexing and triplexing are given briefly. Concerning the latter we quote the following:

In operating the duplex process in the South it has been found that owing to the high phosphoric acid content of the slag it is difficult to prevent the reduction of some of the phosphorus after recarburizing. This rephosphorization of the steel occurs mainly in the ladle, particularly in the portion of the metal in direct contact with the mass of floating slag, and is most noticeable in the last two or three ingots from each ladle of steel teemed. In order to over-

come this defect and at the same time increase the production of basic slag for phosphate fertilizer, one plant has developed a triplex process in which two basic open hearth units are required to finish the metal after blowing in the converter. Briefly, the process is as follows: After blowing, the metal is transferred from the converters to primary basic tilting furnaces where it is treated with lime and the other necessary oxides for dephosphorizing it. Here the phosphorus content in the metal is reduced to about 0.07 per cent, when it is poured into ladles and transferred by specially constructed, heavy, extra-wide-gage trucks to a finishing unit composed of an equal number of similar furnaces. In these furnaces the phosphorus content of the metal is brought below 0.04 per cent, when the steel is finished in the ladle by the addition of the necessary recarburizer and deoxidizers, and any alloys required by the specification. It is said that this process does not reduce the capacity of the plant and materially improves the uniformity and quality of the steel produced.

It is a distinction of the book before us that it deals more fully than any other with American rolling mill practice. Naturally—and this is true throughout the work—it is the practice at the Carnegie works that is described. The average textbook must deal in generalities or it may give typical practice, but usually without indicating where the practice is followed. Sometimes, in fact, textbook statements are not typical or they are not abreast of the times. Mr. Camp's readers know that they are following what is done every day by the largest steel company of the country. On page 360, for example, a summary is given of soaking pit practice as carried out at Duquesne.

Mention should be made of the frequency with which the authors deal in valuable illustrative statements. An interesting one, illustrating the large outputs possible in open-pit mining, is that "in 1916 the Hull Rust mine alone (a Mesabi range property) shipped 7,665,611 tons of iron ore, more than 10 per cent of the total mined in the United States that year."

On pages 82 and 83 descriptions are given of the installations at the Sharon, Clairton and Homestead plants for the use of powdered coal in open hearth furnaces. The Sharon plant was the first of the Carnegie Steel Co. to use this fuel in the open hearth. At Clairton the plant is equipped to supply five of the 16 60-ton open hearth furnaces, while that at Homestead is designed to furnish fuel for all of the No. 3 open hearth plant, consisting of 24 60-ton furnaces. The burners at Sharon are mechanically fed, while those at Clairton and Homestead are wholly pneumatic.

The average textbook would put the reader on his guard as to the influence of sulphur on steel. Sulphur effects were formerly believed to be always evil. But on page 572 we are told that while in the form of ferrous sulphide, sulphur is capable of doing great harm in steel by causing redshortness, "when neutralized with manganese in sufficient amount it may be comparatively harmless, even when present to the extent of a much higher content than 0.10 per cent." Further on occurs this paragraph:

This fibrous structure of high sulphur steel is made use of in the manufacture of free cutting steel, like screw stock, for example, because the free cutting properties of this steel are undoubtedly due to its fibrous structures. Thus, in this case, at least, sulphur is to be regarded as a friend rather than as a foe. In this connection it should be observed that experiments conducted during 1914 and 1915 in both this country and England tend to show that sulphur, when accompanied with a sufficient amount of manganese, is not such an enemy as it is sometimes supposed to be. Extensive investigations by our own research department have shown that there is practically no difference in steels containing from 0.030 per cent to 0.120 per cent sulphur.

A table showing the relation of Brinnell hardness numbers to tensile strength is another illustration of the new content of the book. The authors present a table giving Brinnell hardness numbers and estimated tensile strength for 3000 kg. pressure on a 10 mm. ball testing machine, and accompanying it is the following comment:

It is both a curious and a significant fact that the Brinnell hardness number bears a close relation to the ultimate strength, as may be seen from an inspection of the accompanying table which was prepared only after comparing

results obtained upon thousands of specimens, to which both the Brinnell and the pulling tests had been applied. This relation is approximately 500, and holds for all grades of carbon steel, whether they be heat treated or in their natural state as forged or rolled. For this reason the Brinnell test is applicable to the rapid testing of steel from which samples for the tensile test cannot be obtained.

In the rolling mill section of the book, the various types of mills are described with great thoroughness. The rolling of blooms and slabs has a chapter of 25 pages and that devoted to the rolling of billets and other semi-finished products is of equal length. Plate mill practice takes up 16 pages and there is a chapter on the rolling of large sections which covers 33 pages. The rolling of strip and merchant mill products is described in 27 pages.

Canadian Iron and Steel Statistics for 1919

The shipments of iron ore from Canadian mines in 1919 were the lowest in 19 years, according to the report on the mineral production of Canada by the Department of Mines. It amounted to 195,970 tons, valued at \$686,368, as against 211,608 tons, valued at \$885,893 in 1918.

The total production of pig iron in 1919, excluding ferro-alloys was 917,346 short tons, valued at \$24,536,432, as compared with 1,195,551 short tons in 1918, valued at \$33,495,171, showing a falling off of 23 per cent. Of the 1919 total 910,080 tons was made in blast furnaces and 7266 tons was made in electric furnaces from scrap metal, chiefly shell turnings. In 1918 the blast furnace production was 1,163,510 tons and the electric furnace production from scrap steel was 32,031 tons. Less than one-quarter as much pig iron was made from electric furnaces from scrap steel as in the previous year, the output being derived from six furnace plants in 1919 as compared with 10 plants operated in 1918. By grades the 1919 production included: Basic, 580,426 tons; Bessemer, 7637 tons; foundry and malleable, etc., 322,017 tons; low phosphorus iron (electric furnace), 7266 tons. The 1918 production included: Basic, 966,409 tons; Bessemer, 15,415 tons; foundry and malleable, etc., 181,696 tons; low phosphorus iron (electric furnace), 32,031 tons.

The production of ferro-alloys in 1919 was about 48,579 tons, valued at \$1,998,779. In 1918 the production was 44,704 tons, valued at \$4,731,521. Over one-half the tonnage made in 1918 was spiegeleisen made by the Algoma Steel Corporation for its own use. The exports of pig iron during 1919 were 63,605 tons, valued at \$1,820,260, or an average of \$28.62 per ton and of ferro-alloys 22,449 tons valued at \$1,229,341, or an average of \$54.76 per ton. The imports during 1919 included 35,800 tons of pig iron valued at \$1,022,871, or an average of \$28.80 per ton, and 16,221 tons of ferro-alloys, valued at \$901,678, or an average of \$55.58 per ton, making a total import of pig iron and ferro-alloys of 52,021 tons valued at \$1,924,549.

The total production of steel ingots and direct steel castings in 1919 was 1,031,329 short tons, of which 994,349 tons were ingots and 36,980 tons direct steel castings. The total production in 1918 was 1,873,708 short tons, of which 1,800,171 tons were ingots and 73,537 tons were castings. The 1919 production included: open hearth steel, 1,008,540 tons; electric steel, 15,467 tons; crucible and converter steels, 7322 tons. The 1918 production included: open hearth steel, 1,746,334 tons; electric steel, 119,130 tons; crucible and converter steels, 8244 tons. The total production of electric furnace steel in 1917 was 50,467 tons and in 1916 19,639 tons. The total production of pig iron, ferro-alloys and steel in electric furnaces was about 43,540 tons in 1919, as compared with 191,869 tons in 1918 and 101,031 tons in 1917.

The production of rolled iron and steel products in 1919 included: steel rails 316,304 short tons; plates and sheets, 25,408 short tons; wire rods, 153,723 short tons and structural shapes, 29,295 short tons and a

Part 3 deals with the constitution, heat treatment and composition of steel, perhaps the most fascinating study of all in the book, since the progress in alloy steels and in heat treatment has been the most noteworthy feature of the advance of recent years. The sections dealing with steel as an alloy of iron and carbon, with thermal critical points of steel, and with annealing and hardening and tempering contain familiar matter, followed by a highly interesting discussion of the influence of constituent elements of commercial carbon steel upon its mechanical properties and 20 pages of data on alloy steels.

In whole and in detail this work of Mr. Camp and his associate is admirable. They have given the industry the sort of book for which it has been waiting.

large tonnage of iron and steel bars, rods, etc., for which returns are not yet complete. The total production in 1919 of finished rolled products was 1,146,610 short tons, which included steel rails, 162,747 tons; wire rods, 154,749 tons; merchant bars and rods and structural shapes 415,017 tons; plates and sheets, 26,413 tons; rolled blooms and billets for forging purposes and rolled blooms, billets or slabs sold for export 395,644 tons.

Plan Expansion of Youngstown Steel Car Co.

The Youngstown Sheet & Tube Co. and the Brier Hill Steel Co., both of Youngstown, Ohio, have acquired a heavy interest in the Youngstown Steel Car Co., which operates a plant at Niles, Ohio. The plant represents an investment of about \$1,000,000 and will be used chiefly for repair work. It is intended to later erect additional works for the building of steel cars complete. Plans provide for the erection ultimately of a plant to cost at least \$5,000,000, with a capacity for the manufacture of thousands of steel cars yearly, and to require the plate output of the Youngstown district.

Plans for development of the company have been worked out by James A. Campbell, president of the Sheet & Tube company, and by W. A. Thomas, director and member of the executive committee and former president of the Brier Hill company.

In view of expected equipment demands the railroads will make in the next few years, it is certain that the Youngstown Steel Car Co. will find a ready market for its product, which will tax its capacity. This seems especially probable in view of the fact that the principal stockholders of the company are important patrons of the railroads and will be in position to secure orders from them.

It is expected one and likely several other independent iron and steel producers in this territory will become financially interested in the car building works. The plant is located on a 100-acre site, with rail connections with the Baltimore & Ohio, Erie and Pennsylvania railroads and with frontage along the Mahoning River.

The Youngstown Steel Car Co. was originally founded by Milliken & Boyd in 1881, and later sold by them to George T. Oliver of Pittsburgh. Later it passed into the hands of its present owners, a stock company. Directors are A. E. Adams, George F. Alderdice, R. E. Cornelius, James A. Campbell, U. C. DeFord, L. B. McKelvey, Porter Pollock, William Wilkoff, D. J. Wilkoff and L. C. Wilkoff.

It is planned to so develop the property that it will take care of the equipment needs of the large independent steel producers in the Mahoning and Shenango Valleys.

A permit has been issued for an addition to the plant of the Waterbury Farrel Foundry & Machine Co., Waterbury, Conn. The addition consists of one-story, 180 x 43 ft., with two ells, 50 x 47 ft. and 20 x 17 ft.

Follansbee Bros. Co. Pittsburgh, which closed down its tin plate works at Follansbee, W. Va., on June 30, for repairs, plans to resume operations next week.

SHORT TRADE ITEMS

The Bancroft & Martin Rolling Mills Co., Portland, Me., has purchased a two-story barrack erected by the Government during the war on the South Portland property used by the Cumberland Shipbuilding Co. for installing boilers, etc., in vessels built at Portland. The barrack is approximately a quarter mile from the Bancroft & Martin plant, and is equipped with shower baths, electric lights, a hotel cooking range, refrigeration and other modern appliances. Sixteen individual sleeping rooms, a large assembly room and self-service eating hall are being fitted up by the new owners. The company employs 400.

A machine for electrically welding steel tape such as is used in the armoring of cables has been constructed by the Westminster Engineering Co., Ltd., Victoria Road, Willesden Junction, England, to the specifications of the Electric Welding Co., 28 Basinghall Street, E. C. 2, London. The machine is designed to butt weld tape 1½ in. wide by 0.03 in. thick. There is no lap, and when the upset has been dressed off, it is stated that the joint has the same cross sectional dimensions as the original tape.

The Koppers Co., Pittsburgh, has issued in pamphlet form with illustrations, the paper entitled "Recent Developments in By-Product Coke Oven Engineering," the joint work of Joseph Becker and F. W. Sperr, Jr., respectively consulting engineer and chief chemist of the Koppers Co., and read before the meeting of the Blast Furnace and Coke association of Chicago on March 30, 1920.

The first definite announcement by officials of the C. H. Wills Motor Co., Marysville, Mich., concerning production plans was made last week. It was stated that an eight-cylinder car will be made, to sell for about \$3,000. A production of 10,000 cars is planned for the first year. The company is offering \$1,000,000 of 8 per cent preferred stock, which has been largely subscribed. No public offering will be made. This amount, together with \$2,000,000, paid by Mr. Wills for that amount of second preferred stock, will be used to complete the plant and buy equipment. In addition to the stock sale, bankers have arranged a revolving credit fund of \$2,500,000 to furnish working capital.

A. F. Thame & Co. have brought suit in Mahoning County Common Pleas Court at Youngstown, Ohio, to recover \$24,891.05, and Bond Bros. & Co. have instituted action to recover \$88,332 from Carnick Bros. Co., Youngstown, Ohio, extensive dealers in scrap metals. The actions are based on alleged failure to ship scrap iron to plaintiff companies according to contract. It is alleged in the petitions the material was not according to specifications.

In the line of cutlery the Winchester Repeating Arms Co. plans to place on the market pocket knives, kitchen knives and tools of various kinds, scissors and shears, from the embroidery and pocket scissors to shears of tailors and paper-hangers, carving sets and various tool knives. All these lines of cutlery, it will be noticed, represent steel products.

S. F. Bowser & Co., Inc., oil tanks, pumps and storage systems, Fort Wayne, Ind., held its annual sales convention June 28 to July 2 in honor of the 1919 members of the Pacemakers' Club. Membership in this club is a reward for securing 500 points of business based on volume and class of equipment sold. All members of the sales force were eligible for the convention this year. The salesmen pinned a badge of honor upon each workman as a symbol of the importance of the production department. Band concerts, speeches, sports, banquets, demonstrations of Bowser equipment and sight-seeing were included in the main attractions.

Nineteen sales representatives of the A. M. Castle Iron & Steel Co., Chicago, recently completed a four-

day trip of inspection of mills at Youngstown and Pittsburgh under the direction of W. D. Monroe, manager of sales. At Youngstown they visited the Youngstown Sheet & Tube Co. and at Pittsburgh the Oliver Iron & Steel Co.

The Wellman-Seaver-Morgan Co., Cleveland, has taken a contract for the steel work for two 200-ton tilting furnaces for the Imperial Steel Works, Japan. These furnaces will be used in connection with a Talbot process. They will be fired with producer gas and their tilting mechanism, door lifting mechanism and valves will all be electrically operated.

The Champion Bed Spring Co., Cleveland, has changed its name to the Champion Spring Co., and has awarded a contract for the erection of a two-story plant, 58 x 172 ft., at 6500 Park Avenue, S. E.

The Harry Levey Corporation has been established as the producer and distributor of industrial educational films with temporary headquarters at the Hotel Astor, New York. Mr. Levey recently resigned as manager of the industrial department of the Universal Film Mfg. Co.

"The Selection and Placement of Employees" has been issued as Bulletin No. 49 by the Federal Board for Vocational Education, Washington. There are 84 pages. The bulletin was prepared by Philip J. Rielly, head of the personnel division of the Retail Research Association of New York, formerly employment manager of the Dennison Mfg. Co. The author was lieutenant-colonel of the United States Army in charge of personnel classification of enlisted men in camp. The bulletin is devoted to the practices that have been found effective in the selection and progression of employees. Many pages are given up to a discussion of rating scales and to methods for rating individuals.

Effective July 1, the operating force at the Government arsenal, Amato, N. J., has been reduced about one-third, leaving approximately 200 operatives at the works. During the war this plant was used for shell-loading, giving employment to 6000 persons. The aircraft department of the United States Navy, which has been occupying the plant of the Ancona Printing Co., Gloucester City, N. J., has arranged for the immediate vacation of the property.

The mill type forge shop of the Whiting Foundry Equipment Co., Harvey, Ill., has a unique arrangement of small doors at the ground level, extending all around the building. These, with ample windows and a monitor running the full length of the building, give good ventilation and make it possible to maintain a comfortable working temperature. The fires are also arranged so that the smiths are not working in line of any furnace, and a Buffalo down draft system eliminates smoke. The result is that the men are in good condition after a hard day's work. The shop is equipped to handle light and heavy forgings, including crane hooks from 1 to 200 tons' capacity.

An industrial department has been authorized by the board of directors of the American Association of Engineers, 63 East Adams Street, Chicago. Steps are under way to organize the department and take up the consideration of the problems of mechanical, electrical and chemical engineers in industrial work. A. M. Cornell, chief engineer, Pettibone & Mulliken Co., Chicago, will temporarily supervise the activities of the department. A meeting of the members of the association will be held in Portland, Oregon, in connection with the A. S. C. E. convention, Aug. 10 to 12. The association now has 19,554 members.

T. B. Laycock, Son & Co., manufacturers of children's bicycles, Indianapolis, have made a shipment by mail to Alfred Herbruger, a merchant in Guatemala City, Central America. The company will make a shipment to Alaska by parcel post.

Work has been started on the new foundry for the Petroleum Heat & Power Co., Stamford, Conn. It will have one story, 60 x 80 ft., with steel frame covered with corrugated steel on concrete foundations.

Non-Ferrous Metals

The Week's Prices

Cents Per Pound For Early Delivery

| | Copper | | Tin | Lead | | Zinc | |
|------|----------|--------------|----------|----------|-----------|----------|-----------|
| | New York | Electrolytic | New York | New York | St. Louis | New York | St. Louis |
| July | Lake | | | | | | |
| 14 | 19.00 | 19.00 | 50.00 | 8.50 | 8.25 | 8.25 | 7.90 |
| 15 | 19.00 | 19.00 | 49.87½ | 8.65 | 8.35 | 8.25 | 7.90 |
| 16 | 19.00 | 19.00 | 50.25 | 8.75 | 8.50 | 8.25 | 7.90 |
| 17 | 19.00 | 19.00 | ... | 8.75 | 8.50 | 8.25 | 7.90 |
| 19 | 19.00 | 19.00 | 49.75 | 8.75 | 8.50 | 8.25 | 7.90 |
| 20 | 19.00 | 19.00 | 49.50 | 8.75 | 8.50 | 8.30 | 7.95 |

NEW YORK, July 20.

Demand is light in all the markets and prices in all cases are strong. Continued improvement characterizes the copper market. Demand for tin is light, particularly from consumers, and prices are firm. The lead market is exceedingly strong with the price tendency upward. The zinc market is quiet but firm. Antimony is unchanged.

New York

Copper.—There continues to be a moderate but satisfactory demand for copper from both domestic and foreign buyers, the latter being especially good. The tone of the entire market is strong, but there is no boom apparent. Prices of the leading producers of both Lake and electrolytic copper continue firm at 19c., New York, for prompt and third quarter delivery, with some asking 19.25c. for last quarter, at which level some sales have been made. From small producers and dealers there continues to be a limited amount available as low as 18.50c. to 18.75c., New York.

Tin.—The feature of this market is the buying back of contracts made by London sellers. The fact that the New York market is lower than the cost of importation is the explanation. It is cheaper for London sellers to buy back quantities of tin sold for delivery here for shipment from the East to New York. As a result of this, the metal originally scheduled for arrival in this country will be diverted to London and, should this condition continue for some time, it would ultimately result in a shortage of tin in the American market. Because there have been very few London sellers active in this market, the market has been quiet and demand for both spot and other positions has been light. Consumers still remain aloof from the market. On Friday there was a fair amount of buying in this market from London at 50c. to 50.25c., with 50.50c. bid at the close. Sales on the New York Metal Exchange in the last week continued exceedingly light, averaging less than 100 tons. Spot Straits is quoted to-day at 49.50c., New York, with the London market on the same grade at £288 per ton, with spot standard tin quoted there at £268 and future standard at £272. Arrivals thus far this month have been 2365 tons, with the quantity afloat reported as 5700 tons.

Lead.—This market is exceedingly strong. The same underlying conditions which have existed for some time continue to prevail, only intensified. These may be summarized as heavy consumption, lack of supply, transportation troubles and reduced production. It is the general opinion that the leading interest is not selling, and, therefore, that its quotation of 7.75c., St. Louis, or 8c., New York, is nominal. It is believed that the price is kept at this low level to prevent importation of foreign lead. That this will ultimately be without effect is probable because imported lead is already offered at 8.62½c., duty paid. Lead for prompt shipment from the West has been sold at the equivalent of 8.90c., New York, and sales of spot lead have been made at 9.12½c., New York, with sellers offering it at 9.25c. There is a better demand for spot lead, with a little more available than recently. We quote the outside market at 8.50c., St. Louis, or 8.75c., New York, for early delivery.

Zinc.—The market is exceedingly quiet but the underlying conditions are strong. Sales as well as inquiries are in moderate volume, and the price tendency is slowly upward. Producers, as a rule, are not selling beyond August, although in one or two cases sales for delivery in September have been made. Stocks are admittedly declining and production is not heavy. The mines which two or three weeks ago closed down indefinitely have in most cases resumed. We quote Prime Western for prompt or third quarter delivery at 7.95c., St. Louis, or 8.30c., New York.

Antimony.—The market is unchanged at 7.50c. to 7.75c., New York, duty paid, for wholesale lots for early delivery.

Aluminum.—The virgin metal, 98 to 99 per cent pure, for early delivery in wholesale lots is quoted at 33c., New York, by the leading interest, and at 31.50c. by outside sellers.

Old Metals.—The market has been firm and while actual business has not been as heavy as might be expected when the market shows a rising tendency, inquiry has been better. Dealers' selling prices are nominally as follows:

| | Cents Per Lb. |
|---|---------------|
| Copper, heavy and crucible | 18.75 |
| Copper, heavy and wire | 17.25 |
| Copper, light and bottoms | 15.00 |
| Brass, heavy | 13.00 |
| Brass, light | 9.00 |
| Heavy machine composition | 17.75 |
| No. 1 yellow rod brass turnings | 10.50 |
| No. 1 red brass or composition turnings | 15.00 |
| Lead, heavy | 7.75 |
| Lead, tea | 6.00 |
| Zinc | 6.00 |

Chicago

JULY 20.—Copper has been quiet but firm. Tin has been erratic so far as demand is concerned but is unchanged as to price. Lead has advanced, the demand being in excess of offerings. Spelter is firm though quiet, while antimony is still inactive. We quote Lake copper at 19c. to 19.25c. in carload lots; tin, 53c. to 54c.; lead, 8.80c.; spelter, 8c.; antimony, 10c. On old metal we quote copper wires, crucible shapes, 13.50c.; copper clips, 13.50c.; copper bottoms, 11.50c.; red brass, 13.50c.; yellow brass, 9c.; lead pipe, 6.25c.; zinc, 4.25c.; pewter, No. 1, 25c.; tin foil, 30c.; block tin, 40c., all these being buying prices for less than carload lots.

St. Louis

July 19.—Fair activity in the lead market has developed, there being heavier sales than recorded in a month or more, with prices advancing. Early in the period transactions were made at 8.37½c. and later at 8.50c., and at the close Saturday the latter figure was bid for sizable tonnages, with no takers. Users are needing supplies and stocks are moderate, which, coupled with greater strength elsewhere, gave a decidedly bullish tinge to the market. Slab zinc was also on the upturn, with sales at 7.90c., against 7.75c. the week before. Speculators are casting around for bargains, and independent producers are quite firm in their views on the market. In less than car lots the quotations were: Lead, 8.75c. to 8.87½c.; slab zinc, 8.50c. to 8.62½c.; tin, 50c.; copper, 19.50c.; antimony, 10.50c. In the Joplin district zinc ore was unchanged at \$45 to \$46; calamine, \$35. Lead ore, \$90. The mines have resumed after a fortnight's shutdown. On miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 8c.; heavy red brass, 14c.; light copper, 12c.; heavy yellow brass, 10c.; heavy copper and copper wire, 14c.; zinc, 4.50c.; lead, 5.50c.; pewter, 25c.; tin foil, 38c.; tea lead, 3c.; aluminum, 20c.

Receipts and shipments of lead and slab zinc at St. Louis during the last two weeks were as follows:

| | Receipts | Pigs of Lead | Slabs of Zinc |
|--------------------|----------|--------------|---------------|
| Week ended July 17 | 17 | 46,860 | 65,820 |
| Week ended July 10 | 10 | 48,630 | 63,060 |
| Shipments | | | |
| Week ended July 17 | 17 | 27,910 | 145,060 |
| Week ended July 10 | 10 | 20,960 | 117,806 |

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Freight rates from Pittsburgh on finished iron and steel products, in carload lots, to points named, per 100 lb., are as follows:

New York, 27c.; Philadelphia, 25c.; Boston, 29½c.; Buffalo, 21c.; Cleveland, 17c.; Cincinnati, 23½c.; Indianapolis, 24½c.; Chicago, 27c.; St. Louis, 34c.; Kansas City, 59c.; St. Paul, 49½c.; all in carloads, minimum 36,000 lb. To Denver the rate is 99c., minimum carload 40,000 lb.; Omaha, 59c., minimum carload 36,000 lb.; Birmingham, 57½c., minimum carload 36,000 lb. To the Pacific Coast the rate is \$1.25 per 100 lb. on articles of iron and steel, minimum carloads 80,000 lb., while the structural steel rate is \$1.25, minimum carload 50,000 lb., or \$1.315, minimum carload 40,000 lb. The rate on ship plates, Pittsburgh to Pacific Coast, is \$1 per 100 lb., minimum carload 80,000 lb. On wrought iron and steel pipe, the rate from Pittsburgh to Kansas City is 56c.; to St. Paul 49½c.; to Denver, 99c.; to Omaha, 56c., all in carload lots, minimum 46,000 lb. To Jacksonville, Fla., all rail carloads, 41½c., minimum 36,000 lb., less than carloads, 59c.; rail and water, carloads 34½c., minimum 36,000 lb.; less than carloads 46½c. On iron and steel items not noted above, the rates vary somewhat, and are given in detail in the regular railroad tariffs.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in., on one or both legs, ¼ in. thick and over, and zees, structural sizes, 2.45c. to 3.25c.

Wire Products

Wire nails, \$3.25 to \$4.50 base per keg; galvanized, 1 in. and longer, including large-head barbed roofing nails, taking an advance over this price of \$1.50 and shorter than 1 in., \$2. Bright basic wire, \$3 to \$4 per 100 lb.; annealed fence wire, Nos. 6 to 9, \$3 to \$4.25; galvanized wire, \$3.70 to \$4.70; galvanized barbed wire and fence staples, \$4.10 to \$5.10; painted barbed wire, \$3.40 to \$4.45; polished fence staples, \$3.40 to \$4.50; cement-coated nails, per count keg, \$2.85 to \$4.10; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts of the American Steel & Wire Co. on woven-wire fencing are 60 per cent off list for carload lots, 59 per cent for 1000-rod lots, and 58 per cent for small lots, f.o.b. Pittsburgh.

Bolts, Nuts and Rivets

Large structural and ship rivets.....\$4.50 base
Large boiler rivets.....4.60 base
Small rivets......45 per cent off list
Small machine bolts, rolled threads, 40 and 5 per cent off list
Some sizes in cut threads......30 and 10 per cent off list
Longer and larger sizes of machine bolts..30 per cent off list
Carriage bolts, ½ in. x 6 in.:
Smaller and shorter, rolled threads, 30 and 10 per cent off list
Cut threads......30 per cent off list
Longer and larger sizes......25 per cent off list
Lag bolts......45 per cent off list
Flow bolts, Nos. 1, 2 and 3 head......35 per cent off list
Other style heads......20 per cent extra
Machine bolts, c.p.c. and t. nuts ½ in. x 4 in.:
Smaller and shorter......30 per cent off list
Longer and larger sizes......20 per cent off list
Hot pressed and cold pressed sq. or hex, blank nuts.....\$1.50 off list
Tapped nuts.....\$1.00 off list
Semi-finished hex nuts, U. S. S. and S. A. E.:
5-in. and larger......50 and 10 per cent off list
9-16-in. and smaller......50 and 10 per cent off list
9-16-in. and smaller, A. L. A. M. or S. A. E.,
60 and 5 per cent off list
Store bolts in packages......60 and 10 per cent off list
Store bolts in bulk......60, 10 and 2½ per cent off list
Tire bolts......50 per cent off list
Track bolts......7c. base
One cent per lb. extra for less than 200 kegs. Rivets in 100-lb. kegs 25c. extra.
All prices carry standard extras f.o.b. Pittsburgh.

Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers, \$52 to \$80; chain rods, \$75 to \$80; screw stock rods, rivet and bolt rods and other rods of that character, \$75. Prices on high carbon rods are irregular. They range from \$80 to \$100, depending on carbons.

Railroad Spikes and Track Bolts

Railroad spikes, 9/16-in. and larger, \$4 per 100 lb. in lots of 200 kegs of 200 lb. each or more; spikes, ¾-in. and 1-in., \$4.25 to \$4.50; 5/16-in., \$5 to \$5.25; track bolts, \$7. Boat and barge spikes, \$4.50 per 100 lb. in carload lots of 200 kegs or more, f.o.b. Pittsburgh. Tie plates, \$3 to \$4 per 100 lb.

Terne Plates

Prices of terne plates are as follows: 8-lb. coating, 200 lb. per package; 8-lb. coating, I. C., \$14.10; 12-lb. coating, I. C., \$15.80; 15-lb. coating, I. C., \$16.80; 20-lb. coating, I. C., \$18.05; 25-lb. coating, I. C., \$19.30; 30-lb. coating, I. C., \$20.30; 35-lb. coating, I. C., \$21.30; 40-lb. coating, I. C., \$22.30 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 2.35c. to 4c. from mill. Common bar iron, 4.75c.

Wrought Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card:

| Butt Weld | | | |
|-------------------------------------|-----------|-----------|------------|
| Steel | | Iron | |
| Inches. | Black | Inches. | Black |
| 1½, 1¼ and ¾ | 47 to 50½ | 20½ to 24 | 15½ to 25½ |
| 1½ | 51 to 54½ | 36½ to 40 | 19½ to 29½ |
| ¾ to 3 | 54 to 57½ | 41½ to 44 | 24½ to 34½ |
| Lap Weld | | | |
| 2 | 47 to 50½ | 34½ to 38 | 20½ to 28½ |
| 2½ to 6 | 50 to 53½ | 37½ to 41 | 2½ to 6 |
| 7 to 12 | 47 to 50½ | 33½ to 37 | 7 to 12 |
| 13 and 14 | 37½ to 41 | | 19½ to 27½ |
| 15 | 35 to 38½ | | 6½ to 14½ |
| Butt Weld, extra strong, plain ends | | | |
| 1½, 1¼ and ¾ | 43 to 46½ | 25½ to 29 | 1½ to 17 |
| 1½ | 48 to 51½ | 35½ to 39 | 1½ to 17 |
| ¾ to 1½ | 52 to 55½ | 39½ to 43 | 1½ to 17 |
| 2 to 3 | 53 to 56½ | 40½ to 44 | 1½ to 17 |
| Lap Weld, extra strong, plain ends | | | |
| 2 | 45 to 48½ | 33½ to 37 | 21½ to 29½ |
| 2½ to 6 | 48 to 51½ | 36½ to 40 | 2½ to 6 |
| 7 to 12 | 47 to 50½ | 35½ to 39 | 2½ to 6 |
| 13 to 14 | 43 to 46½ | 20½ to 33 | 7 to 8 |
| 15 | 38 to 41½ | 24½ to 28 | 9 to 12 |

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variations in weight of 5 per cent.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers have been seven (7) points lower (higher price) than carload lots and on butt and lap weld galvanized iron pipes have been nine (9) points lower (higher price).

Boiler Tubes

The following are the prices for carload lots f.o.b. Pittsburgh:

| Lap Welded Steel | Charcoal Iron |
|-----------------------------|--------------------------|
| 3½ to 4½ in.20½ to 40½ | 1½ and 1¾ in. +20 |
| 2½ to 3½ in.10½ to 30½ | 2 and 2½ in. +10 |
| 2½ in.4 to 24 | 2½ and 2¾ in. +1 |
| 1½ to 2 in.+½ to -19½ | 3 and 3½ in. -1½ |
| | 3½, 4 and 4½ in. -8 |

Standard Commercial Seamless—Cold Drawn or Hot Rolled

| Per Net Ton | Per Net Ton |
|-----------------|----------------------|
| 1 in.\$327 | 1½ in.\$207 |
| 1½ in.267 | 2 to 2½ in.177 |
| 1¾ in.257 | 2½ to 3½ in.167 |
| 1½ in.207 | 4 in.187 |
| | 4½ to 6 in.207 |

These prices do not apply to special specifications for locomotive tubes nor to special specifications for tubes for the Navy Department which will be subject to special negotiations.

Sheets

Prices of the Steel Corporation for mill shipments on sheets of United States standard gage in carloads and larger lots for indefinite delivery are given in the left-hand column. For reasonably prompt delivery, mills are getting up to the prices quoted in the right-hand column:

| Blue Annealed—Bessemer | |
|---|---------------|
| No. | Cents per lb. |
| Nos. 8 and heavier | 3.50 to 6.95 |
| Nos. 9 and 10 (base) | 3.55 to 7.00 |
| Nos. 11 and 12 | 3.60 to 7.05 |
| Nos. 13 and 14 | 3.65 to 7.10 |
| Nos. 15 and 16 | 3.75 to 7.20 |
| Box Annealed, One Pass Cold Rolled—Bessemer | |
| Nos. 17 to 21 | 4.15 to 7.80 |
| Nos. 22 to 24 | 4.20 to 7.85 |
| Nos. 25 and 26 | 4.25 to 7.90 |
| No. 27 | 4.30 to 7.95 |
| No. 28 (base) | 4.35 to 8.00 |
| No. 29 | 4.45 to 8.10 |
| No. 30 | 4.55 to 8.20 |
| Galvanized Black Sheet Gage—Bessemer | |
| Nos. 10 and 11 | 4.70 to 8.00 |
| Nos. 12 to 14 | 4.80 to 8.10 |
| Nos. 15 and 16 | 4.95 to 8.25 |
| Nos. 17 to 21 | 5.10 to 8.40 |
| Nos. 22 to 24 | 5.25 to 8.55 |
| Nos. 25 and 26 | 5.40 to 8.70 |
| No. 27 | 5.55 to 8.85 |
| No. 28 (base) | 5.70 to 9.00 |
| No. 29 | 5.95 to 9.25 |
| No. 30 | 6.20 to 9.50 |
| Tin-Mill Black Plate—Bessemer | |
| Nos. 15 and 16 | 4.15 to 6.15 |
| Nos. 17 to 21 | 4.20 to 6.20 |
| Nos. 22 to 24 | 4.25 to 6.25 |
| Nos. 25 to 27 | 4.30 to 6.30 |
| No. 28 (base) | 4.35 to 6.35 |
| No. 29 | 4.40 to 6.40 |
| No. 30 | 4.40 to 6.40 |
| Nos. 30½ and 31 | 4.45 to 6.45 |

Machinery Markets and News of the Works

INQUIRIES ARE FEW

Deliveries of Machine Tools Improving

More Railroad Business Is Placed, but the Aggregate Thus Far Is Less Than Had Been Expected

Outstanding developments in the machine-tool trade are the continued decline in the number of inquiries, the absence of large lists and betterment in deliveries. Many machine-tool manufacturers are quoting considerably earlier deliveries than 30 or 60 days ago, and a few are able to ship machines from stock.

Sellers of tools had hopes that considerable railroad business would have developed by this time, but such is not the case. Several roads are known to have lists prepared, but inquiry is being held back because of lack of appropriations. However, the Chicago, Rock Island & Pacific has finally closed for about \$200,000 worth of shop equipment at Chicago, and the Chesapeake & Ohio

Railroad is reported to have placed orders for its entire list, though formal orders have been in some instances temporarily withheld.

There is comparatively little buying by the automobile industry, and the tire manufacturers at Akron have laid off large numbers of men, who have been seeking employment in other fields.

The Cleveland Board of Education is asking bids on about 20 tools for a technical school.

Despite the slump in automobile buying, a new manufacturing plant at Detroit is projected by the Columbia Motors Co., which has purchased a site. The plant when completed, will employ from 2000 to 3000 men.

Some improvement in the machinists' strike situation at Cincinnati is reported. At one time more than 6000 men were on strike, but this number has been reduced to less than 5000. Some of the plants which have been shut down since May 1 have resumed work with about 30 per cent of their old forces. All are being operated as open shops.

New York

NEW YORK, July 20.

The Chesapeake & Ohio Railroad is reported to have closed for most of its machine-tool requirements, but very little of this business has come to New York sellers. Otherwise, the machine-tool business in the East is extremely quiet. Not even the expected new railroad inquiries have materialized. The Perth Amboy Dry Dock Co., Perth Amboy, N. J., has bought a few machines for a repair shop. The Willys Corporation, Elizabeth, N. J., has bought more tools for balancing up the equipment of its new automobile plant. The Virginia Iron, Coal & Coke Co., Roanoke, Va., has bought a few repair shop tools. Most of the current business, however, is in single tools, and there is comparatively little of that. Some sellers say that sales have dropped to the lowest point in nearly a year.

The General Electric Co. continues to buy miscellaneous equipment for its new Baltimore and Bridgeport plants, but will make no further purchases for the present, at least, for its Schenectady works. A new inquiry calls for two 600 lb. fuel oil furnaces for a brass foundry, one blower with capacity sufficient to operate these furnaces, six molding machines for squeeze and rapping operations, one 30 in. band saw and one double end emery grinder.

The market for locomotive cranes continues active, while overhead crane business remains in much the same state of dullness that has prevailed for the past month. A fair business is also being done by manufacturers of hand-power cranes and hoists. Among current inquiries is one from the Lehigh Valley Coal Co., Wilkes-barre, Pa., for a 5-ton overhead traveling crane and one from the Yukon Gold Co., New York for an 8-ton hand power crane. The latter company, which is preparing to operate extensively in the Malay peninsula, recently purchased two 2-ton, 37-hp. electric hoists from the American Hoist & Derrick Co.

Among other recent sales are: The Browning Co., a 30-ton locomotive crane to the West India Sugars Co., a 20-ton locomotive crane to the American Steel Foundries Co. and a 20-ton locomotive crane to Jacob J. Shannon, Philadelphia; the Shepard Electric Crane & Hoist Co., a 5-ton, 68-ft. 8-in. span overhead traveling crane to the Baltimore Tube Co., Baltimore, and two 5-ton electric hoists to the Union Shipbuilding Co., Curtis Bay, Md.; the Ohio Locomotive Crane Co., a 20-ton, 50-ft. boom locomotive crane to the Southern Pacific Co., New York; the New Jersey Foundry & Machine Co. a 15-ton, 22-ft. 4-in. span hand-power crane to Lockwood, Greene & Co., Boston, for the Dan River Cotton Mills Co., Danville, Va. The Hall Printing Press Co., Dunellen, N. J., has purchased a 10-ton, second-hand industrial locomotive crane. The following

companies have purchased cranes: The Michigan Central Railroad Co., Detroit, a 15-ton and a 20-ton locomotive crane; the Chicago Bureau of Inspection and Tests, Chicago, a second-hand 20-ton locomotive crane; and the Metal & Thermit Corporation, 120 Broadway, New York, a 15-ton eight-wheel locomotive crane.

The Standard Oil Co., 26 Broadway, New York, has completed plans for a number of garages and service buildings for company motor trucks, to cost about \$120,000. They will include a two-story structure, 35 x 62 ft., at Silver Springs, N. Y.; two-story, 25 x 32 ft., at Sherman, N. Y.; two-story, 42 x 45 ft., at Nunda, N. Y., and two-story, 23 x 60 ft., with boiler plant and pumping plant at Oneida, N. Y.

The Elektra Motor Appliances Corporation, New York, has been incorporated at \$200,000 by W. J. McBride, M. H. Hyatt and E. A. H. Watson, 22 William Street, to manufacture metal and mechanical specialties.

The Astell Engineering & Iron Works, Brooklyn, has been incorporated at \$20,000 by G. R. Browne, R. S. Groves and J. S. Regan, 634 Monroe Street, to manufacture iron and steel products.

The Anchor Corrugating Construction Co., 140 Washington Street, New York, has increased its capital from \$65,000 to \$150,000.

The Adirondack Power & Lighting Co., Albany, N. Y., will soon call for bids for the erection of its proposed new hydroelectric power plant on the Mohawk River, near Albany. The General Electric Co., Schenectady, N. Y., is interested in the project. Sargent & Lundy, 72 West Adams Street, Chicago, are structural and mechanical engineers for the company.

The Metal Mining & Brick Mfg. Co., Port Chester, N. Y., has been incorporated at \$200,000 by W. D. Sparborg, S. La Rosa and T. F. J. Connolly, Port Chester, to manufacture metal products and brick and engage in other operations.

The Fordham Plaza Auto Co., Inc., 1856 Bath Avenue, Brooklyn, V. A. J. Cagliostro, president, has taken bids for a three-story automobile service building and repair shop, 100 x 157 ft., on Webster Avenue, near 189th Street, New York, to cost about \$150,000.

The Paragon Can & Cap Co., Inc., 241 Thirty-seventh Street, Brooklyn, manufacturer of metal cans, tops, etc., has increased its capital from \$200,000 to \$500,000.

Disbecker & Co., Inc., New York, has been incorporated at \$20,000 by C. A. Cole, Arthur Oakley and R. A. Van Voorhis, Jersey City, N. J., to manufacture vacuum cleaners and parts.

The Intertype Corporation, 50 Court Street, Brooklyn, is

planning for the installation of a number of machine tools, including lathes and screw machines.

The American Hard Rubber Co., 11 Mercer Street, New York, manufacturer of mechanical rubber products, has filed plans for a four-story brick plant, 54 x 249 ft., at College Point, L. I., to cost about \$200,000.

The Scharch-Atwood Top Corporation, Watertown, N. Y., has been incorporated at \$100,000 by C. L. Scharch, I. F. Atwood and F. K. Purcell, Watertown, to manufacture automobile tops, frames, etc.

The Tolhurst Machine Co., 648 Fulton Street, N. Y., has awarded a contract to the Peter Keeler Building Co., 425 Orange Street, Albany, N. Y., for a one-story addition, 33 x 85 ft.

The Gardner Motor Co., New York, has been incorporated with an active capital of \$1,500,000 by R. Bennett, Jr., F. E. Sturgis, Russell E. Gardner and W. J. Ryan, 14 Wall Street, to manufacture automobiles. As previously announced in THE IRON AGE, the new corporation will take over the business and assets of the Gardner Motor Co., St. Louis. Arrangements are being made to utilize the entire amount of capital immediately. Russell E. Gardner will be president; others interested include Frederick W. Gardner, L. A. Moore, E. H. Burley and Oliver J. Anderson, all of St. Louis; and Ralph Hornblower of Hornblower & Weeks, New York.

The Lowenthal Co., 23 Heywood Street, Brooklyn, manufacturer of rubber products, has filed notice of reorganization, with active capital of \$1,000,000.

The Manhattan Electrical Supply Co., 17 Park Place, New York, manufacturer of electrical products, with plant at Jersey City, N. J., has called a special meeting of stockholders at Boston, July 27, to vote on a recapitalization, with increase in capital stock for expansion.

The Richmond Hill Foundry Co., Brooklyn, has been organized by E. J. A. Williams and J. M. O'Shea, 189 Montague Street, to manufacture iron and steel castings, etc.

The Boston & Albany Railroad Co., Albany, N. Y., is considering the erection of a new repair shop at Chatham, N. Y.

The Bureau of Yards & Docks, Washington, D. C., is taking bids for a new one-story shop and shed building at the Navy Yard, Brooklyn.

The Drapery Hardware Mfg. Co., 87 Thirty-fifth Street, Brooklyn, has increased its capital from \$25,000 to \$100,000.

The I. H. Dexter Co., 27 Walker Street, New York, machinist, manufacturer of flexible couplings, etc., is planning for the installation of a number of machine tools at its plant at Goshen, N. Y.

The Public Service Commission, New York, has ordered the Long Island Railroad Co., Pennsylvania Terminal, to take immediate action in entering into contract for the construction of 100 additional electric cars and auxiliary equipment for service in the electrical zone, to be delivered before the summer of 1921.

The Foundation Co., New York, is arranging for the sale of its shipbuilding plant at Port Huron, Mich., and proposes to hold a public sale for the property on July 29. The yard was purchased by the company during the war period and additional buildings erected, including machine and construction shops, and other works structures; the yard includes drydock and repair facilities, and was operated for work of this character prior to acquisition by the company. During occupancy it has been used for the production of ocean-going tugs and contracts held by the company for vessels of this type were canceled by the Government.

The Firestone Tire & Rubber Co., 1871 Broadway, New York, has awarded contracts for a new automobile tire manufacturing plant at Hamilton, Ont., to cost about \$1,000,000, including equipment.

The Utica Gas & Electric Co., Utica, N. Y., has arranged for a bond issue of \$1,700,000, to be used in part for extensions and improvements in plant and system.

The Reliance Lighting Fixture Corporation, New York, recently organized to manufacture metal gas and electric fixtures, attachments, etc., has taken over the business of the Reliance Electric Lamp & Supply Co., 317 Canal Street.

Harry P. Gould, Lyons Falls, N. Y., has made application to the Public Service Commission for permission to build an addition to his local power plant, operated in conjunction with a plant of the Lyons Falls Paper Mills, for increased generating capacity, with extensions in distributing system to Constableville and vicinity.

Fire July 11, at the ship repair plant of James Shewan & Sons, foot of Twenty-seventh Street, Brooklyn, caused a loss in excess of \$100,000, including stock.

The O'Rourke Crane & Engineering Co., 366 Fifth Avenue,

New York, recently incorporated, will manufacture its different specialties at a plant at Hudson, N. Y. These will include overhead electric traveling cranes, derricks and hoists for industrial plants, docks, terminals, etc. F. E. O'Rourke, president and general manager, was formerly assistant general manager for the Edward F. Terry Mfg. Co., New York; P. R. Moses, vice-president, is also connected with the shipbuilding concern of M. M. Davis & Son, Solomons, Md., and an official of Moses, Pope & Trainer, New York, consulting engineers. John N. Trainer is treasurer.

To carry out its proposed terminal project at Weehawken, N. J., announced in a former issue of THE IRON AGE, the Cunard Steamship Co., 24 State Street, New York, has incorporated the Cunard Terminal Corporation under New Jersey laws, with capital of \$40,000,000. The incorporators are Sir Ashley Sparks, Delow W. Cooke, Richard L. Walker, J. G. Hudson and Robert H. Blake, all of New York. The project will include eight piers of double-decked type, and with electric traveling cranes, conveying machinery, etc., will utilize approximately an amount equal to the capitalization.

The Milliken Brothers Mfg. Co., Woolworth Building, New York, manufacturer of fabricated steel buildings, has filed plans for two one-story steel works buildings on Seventeenth Street, Hoboken, N. J., to cost about \$10,000.

The Fischer-Sweeney Bronze Co., 1301 Grand Street, Hoboken, N. J., manufacturer of exhausters, pumps, castings, etc., has increased its capital from \$100,000 to \$200,000.

Windman-Goldsmith, Inc., 399 East Avenue, Perth Amboy, N. J., has been incorporated at \$100,000 by Philip Windman and David Goldsmith, to manufacture electrical machinery and appliances.

The New Jersey Bus Mfg. Co., West Thirty-fourth Street and McBride Avenue, West Paterson, N. J., is taking bids for a one-story machine shop at 737-9 Madison Avenue, to cost about \$17,000.

The Department of Public Works, Perth Amboy, N. J., is having plans prepared for a one-story automobile service building and repair works, 50 x 100 ft., for municipal automobiles.

A bill of sale has been recorded at New Brunswick, N. J., conveying the property of the Didier-March Co., Keasbey, N. J., manufacturer of refractories, tunnel kilns, etc., to the Carborundum Co., Niagara Falls, N. Y. The consideration is noted as \$70,000, and covers all equipment, tools, raw material and miscellaneous apparatus.

The Vulcan Detinning Co., Sewaren, N. J., has acquired the assets and business of the Republic Chemical Co., Inc., with detinning works at Neville Island, Pittsburgh. This plant will be continued in operation, with Louis Muench, formerly president of the Republic company, in charge.

The American Elco Process Co., Teaneck, N. J., has been incorporated in Delaware at \$300,000 by C. Royalls, Earl A. Barr and Robert A. Shaw, Teaneck, to manufacture rust-proof metal specialties.

The William A. Waters Co. has been organized to operate as a manufacturing jeweler, with works at 50 Columbia Street. William A. Waters, 365 Davis Avenue, Arlington, N. J., heads the company.

A number of industrial plants at Dover, N. J., are arranging for the installation of motors and other electrical equipment, and have signed contracts with the New Jersey Power & Light Co. for service. These include the Richardson & Boynton Co., stove works, about 1000 hp.; T. H. Hoagland & Sons, foundry, manufacturer of iron castings, 115 hp.; the Lime Products Co. of America, 1000 hp., and the Succasunna Sand Co., 150 hp.

The Continental Paper Co., Bogota, N. J., manufacturer of paper composition products, will build an addition to cost in excess of \$50,000.

Joseph T. Ryerson & Son, West Side Avenue, Jersey City, N. J., iron and steel products, have filed plans for a one-story steel addition to cost about \$75,000. Headquarters of the company are at Chicago.

The New York Telephone Co., 222 Morris Avenue, Newark, N. J., has filed plans for a one-story shop at 141 Bruce Street, to be used for repair work.

The Wright Garage Co., Inc., 324 Seventeenth Avenue, Newark, N. J., is having plans prepared for a new service and repair building, one story, 89 x 118 ft., at 1196-1200 Broad Street, cost about \$35,000.

The Atlas Foundry Co., 206 Coit Street, Irvington, Newark, N. J., manufacturer of gray iron castings, will build a one-story addition, 60 x 60 ft.

The Asher Machinery Corporation, Newark, N. J., has been incorporated at \$125,000 by Charles Kriser, Harry E. and Arthur C. Asher, to manufacture machinery and parts.

The American Brake Shoe & Foundry Co., Newark, N.

J., has filed plans for three one-story additions to its plant on Avenue L, 40 x 116 ft.; 20 x 60 ft., and 30 x 31 ft., to cost about \$25,000.

The Interstate Smelting & Refining Co., 29 Commercial Street, Newark, N. J., has acquired property at Hawkins Street and Plum Point Lane, comprising about 69,617 sq. ft., as a site for the erection of a new smelting plant.

The Monroe Calculating Machine Co., 49 Mitchell Street, Orange, N. J., manufacturer of adding machines, etc., will soon take bids for the proposed addition to comprise a four-story building, 65 x 200 ft., estimated to cost about \$150,000.

The Kant-Rust Products Corporation, 142 Market Street, Newark, N. J., has been incorporated at \$250,000 by William F. Veech, I. M. Custer and A. L. Beamer, to manufacture metal products.

The Atlantic Smelting Co., 415 Doremus Avenue, Newark, N. J., has filed plans for a one-story addition to cost about \$10,000.

The Superior Electro Plating Co., 97 Chestnut Street, Newark, N. J., has filed notice of organization to manufacture metal specialties. Frederick Spitalmy, 642 Park Avenue, Elizabeth N. J., heads the company.

The plant of the Hewes & Phillips Iron Works, Orange and Ogden streets, Newark, N. J., has been sold by the Phillips Estate to the New Jersey Machinery Exchange, 21 Mechanic Street. The property aggregates 187 x 350 ft., and includes 12 buildings, comprising about 65,000 sq. ft. of floor area, in addition to a separate parcel noted in a previous issue of THE IRON AGE. The plant has been located at this point since 1858, having been founded in New York in 1845 by John M. Phillips and J. L. Hewes; a year later, the business was moved to Newark, and for a time was conducted at Bridge and Spring streets. The company specialized in the manufacture of engines, boilers and other machinery, and was very active during the Civil War period in the manufacture of munitions for the Union army, including turret rings and turrets for the ironclad Monitor, arm stands, motive machinery for a number of ironclad vessels and large quantities of equipment for gun plants in other sections.

Blancard & Co., Inc., Newark N. J., has been incorporated to engage as a manufacturing jeweler at \$750,000. The incorporators are Frederick J. and Rudolph C. Blancard, 161 Maiden Lane, New York, and Thomas Mountford, 242 Hedden Street, Newark, N. J.

The A. W. L. Toy Mfg. Co., 22 Monmouth Street, Newark, N. J., has been organized to manufacture mechanical and other toys. Louis Adler and William Weiss, 76 Badger Avenue, head the company.

Philadelphia

PHILADELPHIA, July 19.

The Electric Storage Battery Co., Nineteenth Street and Allegheny Avenue, Philadelphia, has filed plans for its proposed plant at Rising Sun Lane and Adams Road, comprising seven buildings to cost about \$224,000. The different structures will include a one and two-story factory, 85 x 150 ft.; two-story factory, 60 x 132 ft.; three-story factory, 85 x 250 ft.; with remainder all one-story plant buildings, 38 x 181 ft.; 100 x 116 ft.; and 97 x 140 ft. in size. The company, a New Jersey corporation, has filed notice of increase in capital from \$18,000,000 to \$30,000,000, a large portion of the proceeds to be used for expansion.

The Prest-O-Lite Co., 30 East Forty-second Street, New York, manufacturer of acetylene equipment, will take bids until about Aug. 5 for its proposed one-story plant at Philadelphia, to cost approximately \$75,000.

The Ordnance Department, Washington, D. C., has awarded a contract to Michael Melody & Son, 1322 Race Street, Philadelphia, for two new buildings at the Frankford Arsenal, Philadelphia, consisting of a three-story and basement works on Tacony Street for small arms production, parts, etc., 85 x 200 ft., to cost \$246,604; and a one-story shop to be equipped for experimental mechanical work.

The Edward G. Budd Mfg. Co., Twenty-fifth Street and Hunting Park Avenue, Philadelphia, manufacturer of steel automobile bodies, steel stampings, etc., has filed plans for extensions and improvements in its machine and assembling shop to cost about \$100,000, and for similar work in another building at the plant to cost \$30,000.

The Meeley Magneto & Parts Co., Philadelphia, has been incorporated at \$100,000 by W. F. Monahan, Michael J. Trochler and Raymond M. Waters under Delaware laws, to manufacture magnetos and ignition equipment for automobile service.

The Reyburn Mfg. Co., Twenty-third Street and Allegheny Avenue, Philadelphia, labels, tags, etc., will expend about

\$600,000 for a new plant, including machinery, at Thirty-second Street, Allegheny and Hunting Park Avenue. The company has just purchased a site at this location, comprising about 300,000 sq. ft., from the estate of John Dobson.

The Lowry Top & Body Co., Gaul and Adams Street, Philadelphia, manufacturer of automobile bodies, etc., has completed plans for rebuilding the portion of its plant destroyed by fire recently. The work will cost about \$25,000, exclusive of any equipment.

The Featherweight Tire Filler Co., Philadelphia, has been incorporated in Delaware at \$100,000 by Joseph L. Zackey, Walter Carroll and George H. Hill, Philadelphia, to manufacture automobile tires and tire accessories.

The F. J. Stokes Machine Co., Seventeenth and Cambria streets, Philadelphia, manufacturer of chemical machinery, etc., has acquired property near Cedar Grove station of the Philadelphia & Reading Railway, to be used as a site for a new plant.

The Diesinger Motors Co., 1827 Chestnut Street, Philadelphia, has awarded a contract to J. Schnabel, Denckla Building, for a two-story service and repair building, 70 x 120 ft., at Twenty-second* and Chestnut streets, to cost in excess of \$50,000.

The General Metallic Hose Co., Philadelphia, has been incorporated at \$10,000 by A. W. Swartz, Ardmore, Pa.; H. Goodall and F. B. Williamson, Philadelphia, to manufacture metal reinforced hose for air brake and other service.

The committee of the Chamber of Commerce, Philadelphia, appointed to negotiate for the purchase of the Hog Island Shipyard to insure its operation as a permanent local industry, has received advices that the property will not be offered for sale until President Wilson appoints the new Shipping Board, as provided in the shipping act passed by the recent Congress.

The Pennsylvania Range & Boiler Co., 2010 North Tenth Street, Philadelphia, has filed plans for a one-story addition to its boiler shop.

The Rainey-Wood Coke Co., Swedeland, Pa., affiliated with the Alan Wood Iron & Steel Co. and W. J. Rainey, Inc., has arranged for a note issue of \$1,000,000, the proceeds to be used for the purchase of 400 all-steel cars, each 70 tons capacity, and estimated to cost \$1,400,000. The company operates a two-battery coke plant, each of 55 ovens, with by-product recovery plant.

The Camden Mfg. Co., Camden, N. J., has been incorporated at \$75,000 by Elmer J. and John J. Carlson, and James P. Stanton, to manufacture pipe and bolt threading machinery, dies, etc.

The Camden Concrete Vault Co., Camden, N. J., has been incorporated at \$100,000 by Augustus Reeser, J. D. Stover and S. M. Shay, Camden, to manufacture steel-reinforced concrete vaults.

The Acme Rubber Mfg. Co., East State Street, Trenton, N. J., manufacturer of automobile tires and mechanical rubber products, has awarded a contract to the N. A. K. Bugbee Co., Hanover Street, for a one-story addition, 90 x 300 ft., to cost about \$60,000.

The Mueller Machine Co., Ward Avenue, Trenton, N. J., manufacturer of clay working machinery, has completed plans for an addition to its machine shop, with alterations in present building, to cost about \$15,000.

The International Motor Co., West Front Street, Plainfield, N. J., manufacturer of motor trucks, has completed the erection of its new plant at Allentown, Pa., to be known as Plant No. 4, and has assembled various smaller operating units at this point for concentrated work. The structure is located on Harrison Street, 300 x 600 ft., and will be used chiefly for assembling operations. The company is erecting another structure on the former Phaon Diehl farm, and expects to have the building ready for occupancy soon. It is reported that the company contemplates the establishment of a steel hardening plant at Allentown.

The Diamond State Fibre Co., Bridgeport, Pa., has commenced the foundation work for the proposed one-story addition to cost about \$80,000, to be equipped for braiding and other manufacturing operations.

Fire, July 10, destroyed a portion of the lower plant of the Pennsylvania Light & Power Co., Harwood, Pa., with loss estimated at about \$200,000. The structure will be rebuilt at once, with temporary repairs now under way. This company is operated by the Electric Bond & Share Co., 71 Broadway, New York.

The Wildman Mfg. Co., Astor and Elm streets, Norristown, Pa., manufacturer of machinery and parts, has taken bids for a foundry.

The Lehigh & Wilkes-Barre Coal Co., Wilkes-Barre, Pa.

is planning for the installation of a number of machine tools.

E. M. Rehrig, Northampton, Pa., has arranged for the establishment of a repair works at 1224 Main Street, to be used for motor work, winding, and other electrical equipment repairs.

The Keeley Stove Co., Columbia, Pa., manufacturer of stoves, ranges, etc., has had revised plans prepared for the proposed 25 x 30 ft. four-story and basement building at its plant, and will ask for bids at an early date.

Buffalo

BUFFALO, July 19.

The Parenti Motors, Inc., Mutual Life Building, Buffalo, is having plans prepared by Architects Bley & Lyman, 250 Delaware Avenue, for a one-story motor manufacturing plant, 100 x 320 ft., at Northumberland and Kensington avenues, to cost \$100,000.

The Buffalo Artercraft Top Co., Buffalo, has been incorporated at \$50,000 by C. P. and F. C. Scott and E. H. Verden to manufacture automobile tops, frames, etc.

The Buffalo Sled Co., North Tonawanda, N. Y., manufacturer of sleds and metal specialties, has filed notice of change of name to the Auto Wheel Coaster Co.

Beals, McCarthy & Rogers, 40-42 Terrace Street, Buffalo, iron and steel products, tools, hardware, etc., have purchased an entire city block, bounded by Elk, Mackinaw, Fitzgerald and Katherine streets, totaling about four acres, for the establishment of a terminal works. At the present time there are three buildings on the site, 500 ft. long, and it is planned to build an extension to each of these structures. The development will be one of the largest ever carried out in this section of the city. The property was formerly used by the Mutual Gas Co. and was purchased from the Buffalo Gas Co.

The Westcott Rule Co., Bayard Street, Seneca Falls, N. Y., manufacturer of rules, metal measuring tapes, etc., has increased its capital from \$25,000 to \$400,000.

The Diepress Co., Cazenovia, N. Y., is having revised plans prepared for its proposed new plant. The factory will be one and two-story, 60 x 160 ft., and is estimated to cost about \$100,000. Monks & Johnson, 99 Chauncy Street, Boston, Mass., are architects.

The Ordnance Salvage Board, Rochester, N. Y., is taking bids up to July 30 for "Plant B" of the Symington Machine Co., on local site, used during the war for the machining of large shells. It consists of one large main building, about 125,000 sq. ft., with power plant, on a site totaling about four acres. It will be sold to the highest bidder with equipment.

The Achilles Rubber & Tire Co., Binghamton, N. Y., is arranging for the installation of new electric equipment at its plant. It is said that within the next 12 months the company proposes to double its present equipment of this kind for greater load.

The Hasbrouck Mfg. Co., Binghamton, N. Y., has been incorporated at \$100,000 by J. L. Sloan, B. D. Leighton and E. Ehlich, Endicott, N. Y., to manufacture check protectors and kindred equipment.

The Wegner Machine Co., 67 Mississippi Street, Buffalo, manufacturer of machinery and parts, has filed notice of change of name to K. W. Schantz, Inc.

The Charles D. Hevenor Co., Buffalo, has been incorporated at \$100,000 by H. M. and J. H. Frothingham and I. Tilden, Buffalo, to manufacture machinery, parts, castings, etc.

The Rochester Electrical Supply Co., 100 St. Paul Street, Rochester, N. Y., manufacturer of electrical products, has increased its capital from \$100,000 to \$250,000.

The Brewer-Tichener Co., Binghamton, N. Y., manufacturer of automobile products, will install new electrical equipment at its plant to total about 400 hp.

The Harder Mfg. Co., Ryder Avenue, Cobleskill, N. Y., manufacturer of agricultural equipment, will build a one-story addition, 40 x 60 ft.

The Franklin Automobile Co., Syracuse, N. Y., has completed financing plans as recently projected, and stockholders have approved of the conversion of 150,000 shares of common stock, par value \$100, into 600,000 shares of common stock of no par value. The company is now producing at a rate of about 60 cars per day, and as soon as the new plant, now nearing completion, is equipped and occupied, this will be increased. A new one-ton air cooled motor, pneumatic tire motor truck has been perfected, and will soon be placed on the market. During the coming

year the company will add over 1000 additional men to the present working force. F. A. Barton is treasurer.

The G. H. Williams Co., Harbarger Lane, Erie, Pa., manufacturer of buckets, derricks, etc., has awarded miscellaneous contracts, including roofing, etc., for the completion of the plant addition now under way, comprising a one-story shop, 43 x 82 ft., to cost about \$40,000.

Chicago

CHICAGO, July 19.

The feature of the market during the past week was the final placing of the Rock Island list, involving an outlay of about \$200,000. Otherwise there has been little activity, although an additional list, issued by the Whiting Foundry Equipment Co., Harvey, Ill., has appeared. This company has bought a shell shop from the G. W. McFarland Engineering Co., Ltd., Paris, Ont., and will use the new equipment to fit the plant for the manufacture of its products in Canada. The Whiting Foundry Equipment Co. list is as follows:

- One bending roll, 10 ft. wide, for 1½-in. plate, arranged for either belt or motor drive.
- One punch with 48-in. throat and arch jaw, capacity, 1½ x 1 in.
- One 80-ton pneumatic bull riveter with 8 to 10-ft. throat.
- One 3-in. horizontal bar.
- One 60-in. or 72-in. spur gear cutter arranged for belt drive.
- One 2-in. keyseater.
- One 42-in. or 48-in. x 14-ft. planer, arranged for belt drive.
- One 4 or 5-ft. radial drill.
- One No. 4 plain milling machine.
- One Universal cutter and tool grinder.
- One 36-in. x 16-ft. engine lathe.

Among other new inquiries in one from the Chicago Elevated Railroad Co. for a 42-in. boring mill. S. F. Bowser & Co., Ft. Wayne, Ind., manufacturer of oil pumps and tanks, has placed an order for a number of machine tools.

Shipments out of stock from local stores have been brought to a halt by a teamsters strike, called on July 13. Railroad service continues to improve slowly, but is still far from normal. As yet few shipments are leaving Cincinnati where a strike was called in the plants of machine tool manufacturers several weeks ago. Other builders, however, are shipping more freely. There are no further changes in price to report. Dealers report that collections are becoming more difficult.

The Dragon Motors Corporation, recently incorporated at \$1,000,000, has purchased the William N. Selig motion picture plant, covering the block bounded by Irving Park Boulevard, Byron Street, Western and Claremont avenues, Chicago, for \$360,000. The property will be transformed into an automobile manufacturing plant. The officers are H. W. Neidich, president; J. J. Heineman, vice-president; A. E. Manheimer, secretary.

The Edward Katzinger Co., manufacturer of bakers' and confectioners' supplies, Washington Boulevard and Sangamon Street, Chicago, has awarded a contract for a seven-story extension, 100 x 121 ft., to cost \$500,000.

A. Finkel & Sons, 1326 Cortland Street, Chicago, will reconstruct their one-story forge shop, recently destroyed by fire with a loss of \$20,000.

James P. Marzano, 931 West Polk Street, Chicago, has let a contract for a one-story machine shop, 48 x 65 ft., at 1001-03 South Hamilton Avenue, to cost \$10,000.

The Designers Instrument Co., 3323 North Clark Street, Chicago, has let contracts for a one-story factory, 40 x 97 ft., at 3819-21 North Ashland Avenue, to cost \$10,000.

The Chicago Casket Co., 1106 Canal Street, Chicago, has purchased from the Bent Piano, Music & Phonograph Co. a six-story factory and warehouse on the northwest corner of Washington Boulevard and Sangamon Street. The company will take possession of the plant immediately.

The Tuthill Spring Co., 750 Polk Street, Chicago, has let a contract for a one-story plant addition, 113 x 119 ft., to cost \$40,000.

The Illinois Metal Process Co., 123 West Madison Street, Chicago, will erect a shop to cost \$5,000 at 4656-58 Arthington Street.

The Benjamin Electric Co., 800 West Washington Street, Chicago, will erect a one-story power house, 77 x 147 ft., at Desplaines, Ill.

The Armstrong Machine & Tool Co., with a capital stock of \$400,000, has taken over the J. C. Armstrong Machine

& Foundry Co. plant and equipment at Washington and Maple streets, Peoria, Ill., and plans to erect an addition which will double the floor space. Among those identified with the new company are A. G. Graham, Chicago; C. A. Conaway, Des Moines, Iowa; D. K. Cook, Ellwood, Iowa; William Hetzel, Davenport, Iowa; H. C. Meier, Council Bluffs, Iowa; C. E. Buchan, Chicago.

The Magnetic Signal Co., 80 East Jackson Boulevard, Chicago, manufacturer of railroad signals, plans to erect a plant at Coal City, Ill., consisting of two units, one 50 x 100 ft., and the other 80 x 100 ft.

The Brunner Machinery Co., Peru, Ill., the Wills Mfg. Co., Mendota, Ill., and the H-B Compressor & Pump Co., Chicago, have been consolidated and will operate the plant of the Brunner company at Peru, under the style of the Mundie Mfg. Co.

The Frost Gear & Forge Co., Jackson, Mich., has let contracts for plant buildings to cost \$75,000.

The Albion Foundry & Machine Co., Albion, Mich., has been incorporated at \$100,000 to take over the foundry of the Union Steel Products Co. Arthur C. Hudnutt is president.

The Crocker Air Line Co., incorporated at \$200,000, will construct a plant consisting of foundry, machine shop and assembling floor, at Idlewild, near Baldwin, Mich. An air-propelled stationary engine will be manufactured.

The Randall Foundry Co. will erect a plant, 90 x 100 ft., between the Michigan Central Railroad and Grand Beach Road, Michigan City, Ind.

The Cicero Tool Works, 1233 South Fifty-second Avenue, Cicero, Ill., is taking bids for the rebuilding of its one and two-story plant, recently damaged by fire, with cost estimated at \$30,000.

The Ansonia Phonograph & Record Co., Chicago, has been incorporated in Delaware at \$2,500,000 by A. E. Manheimer, C. F. Fitzgerald and P. Zak, all of Chicago, to manufacture talking machines and parts.

The C. A. Dunham Co., Fisher Building, Chicago, manufacturer of heating apparatus, is planning a two-story addition to its plant at Marshalltown, Iowa, 40 x 150 ft., to cost about \$150,000.

The Kaw Boiler Works, Waldheim Building, Kansas City, Mo., has completed plans for a one-story addition to its plant at Kansas City, Kan., 40 x 200 ft. and 40 x 90 ft., to be located at First and Walker streets. E. L. Hudson is secretary.

Fire, July 9, destroyed the plant of the Scott Automobile Body Co., Denver, Col., with loss estimated in excess of \$75,000.

The Benis Motor Co., Oregon, Ill., has had plans prepared for a one-story machine and repair shop, brick and concrete, to cost about \$20,000.

The American Forge Co., 2503 Blue Island Avenue, Chicago, has awarded a contract to Charles B. Johnson & Sons, 111 West Washington Street, for a one-story addition at Blue Island and Hoyne avenues, to cost about \$300,000.

The Bell & Howell Mfg. Co., 1803 Larchmont Avenue, Chicago, manufacturer of motion picture machinery, has filed plans for a new three-story addition to cost about \$70,000.

The electric power plant of H. W. Steinmeyer, Clatonia, Neb., was partially destroyed by fire on July 12, with loss of about \$15,000.

The Illinois Central Railroad Co., Chicago, has awarded contracts to the W. J. Zatterell Co., Webster City, Iowa, for additions to its engine houses and repair shops at Amboy and Freeport, Ill., to cost \$50,000 and \$40,000 respectively, and to A. W. Stoolman, Champaign, Ill., for similar construction at the shops at Clinton, Ill., to cost \$100,000.

The Argus Mfg. Co., 402 North Paulina Street, Chicago, metal specialties, is having plans prepared for a one-story plant at Division and Kildare streets, 125 x 170 ft.

Baltimore

BALTIMORE, July 19.

The Miller Safe Co., Fremont Avenue and Briscoe Street, Baltimore, a subsidiary of the York Safe & Lock Co., York, Pa., is taking bids for the initial building of its proposed new plant at Wilkens Avenue and Catherine Street, to comprise a one-story machine shop, power house and office, 124 x 400 ft., to cost about \$400,000, including equipment. J. A. Dempwolf, Center Square, York, Pa., is architect.

The Liberty Tool Corporation, Baltimore, has filed notice of increase in capital to \$600,000 for proposed expansion. Headquarters are in the Munsey Building. E. Oliver Grimes, Jr., is general manager.

The Baltimore & Ohio Railroad Co., Baltimore, has filed

plans for two one-story and one two-story additions to its shops on Gilmore Street, to cost about \$15,000.

The Titan Steel Corporation, Baltimore, has increased its capital to 50,000 shares of common stock of no par value.

The Hillsdale Garage Co., Baltimore, has filed plans for a one-story service and repair building, 40 x 190 ft., on Keyser Street, near Collington Avenue, to cost about \$15,000.

The Consolidated Gas, Electric Light & Power Co., Lexington Building, Baltimore, has completed plans for a new power plant at Dundalk, to be similar to the plant recently completed in the Westport section.

The Hydro Power, Propeller & Dredger Co., Washington, D. C., has been incorporated in Delaware at \$10,000 by Clarence M. and M. T. Brune and E. P. Morey, Washington, to manufacture power dredging machinery.

The Prudential Oil Corporation, Fairfield, Baltimore, is perfecting plans for a large addition to its refining plant to cost in excess of \$1,000,000. The company's property in this section comprises about 100 acres and a large portion of this will be given over to the new plant. Plans have been filed for initial work, covering tanks, etc., to cost about \$143,000. J. O. Jensen is vice-president.

The Collapsible Rim Co., Asheville, N. C., has been incorporated at \$300,000 by James J. Nichols and W. W. Bruce, to manufacture metal rims for automobile wheels. Mr. Nichols will act as president.

The Lynchburg Foundry Co., Lynchburg, Va., manufacturer of agricultural implements, with branch at Chicago, has increased its capital from \$915,000 to \$1,515,000. L. S. McWane is president.

The Maryland Auto Products Co., Hagerstown, Md., recently incorporated at \$200,000 to manufacture small parts for automobile engines and kindred specialties, has acquired the former plant of the Pacific Coast Metal Stamping Co., which will be equipped and occupied at once. James J. Doyle, formerly manager of the Hagerstown & Frederick Electric Railway Co., is president, and George E. Slaybaugh, secretary and treasurer.

The Southern Asbestos Mfg. Co., Charlotte, N. C., is planning for two additions to its plant, to cost about \$65,000.

The Hurley Motor Co., 829 Fourteenth Street, N. W., Washington, D. C., has awarded a contract to Frank L. Wagner, 1413 H Street, N. W., for the erection of a three-story service building, 45 x 60 ft., at Fourteenth and Church streets, to cost about \$90,000.

The Atlantic Ship Service Corporation, Newport News, Va., has been incorporated at \$25,000 to operate a local shipyard; the larger part of operations will be devoted to repair work. Frank Richardson is president and H. B. Lackey, secretary.

The Red Diamond Motors, Inc., Atlanta, Ga., recently incorporated at \$5,000,000, has awarded a contract to the H. D. Best Co., 949 Broadway, New York, for a local plant for the manufacture of automobiles. It is proposed to have the plant ready for operation by the close of the year. W. H. Seabrooke is president; R. E. Hicks, vice-president, and Henry Short, secretary.

In connection with the rebuilding of its plant, recently destroyed by fire, the Hardware Mfg. Co., Charlotte, N. C., will install a complete equipment of woodworking and operating machinery, including bandsaws, mortising machine, shapers, matchers, sander, etc. S. R. Williams is treasurer and manager.

The Motor Parts Corporation, Atlanta, Ga., has been organized with a capital of \$30,000 by C. Y. House and Blair Foster, Atlanta, to manufacture automobile parts and other metal specialties.

Swift & Co., Chicago, have completed plans for a one-story fertilizer plant at LaGrange, Ga., 200 x 350 ft., to cost about \$250,000, including equipment.

The Southern Agricultural Tank Line Co., Atlanta, Ga., has been incorporated at \$1,000,000 by H. F. Garrett, Marion Smith and M. F. Goldstein, to manufacture tank cars, car trucks, etc.

Cleveland

CLEVELAND, July 19.

The machine tool market continues as dull as it has been for several weeks. Sales by dealers are light and mostly single machines. The shipping situation has improved but railroads are still very slow in accepting shipments to some Eastern points. Machine tool builders are getting a scattering lot of small orders and are catching up on deliveries. Cancellations are not numerous. Some automobile companies are still buying equipment in spite of the slowing up of that industry. The Oakland Motor Car Co., which was reported last week to have purchased five turret lathes, has placed an additional order for five machines and the

Willys Corporation has purchased four turret lathes for its Elizabeth, N. J., plant. A Cleveland manufacturer has also taken 13 turret lathes for the Nathan Mfg. Co., New York. Other orders include a round lot of machine tools placed by the Libby Glass Co., Toledo, for the manufacture of glass making machinery and several automatic milling machines placed by the Standard Tool Co., Cleveland. The Cleveland Board of Education will receive proposals July 21 for about 20 tools for the East Technical High School, Cleveland.

A fair volume of inquiry has developed in the past week from the railroads for small lots of machines. Practically no business is coming from the automobile tire and allied industries. A sharp curtailment in the industry has been made by the Akron tire plants and it is believed that the production of tires has reached a point where the output exceeds the demand. This curtailment in the tire industry has probably had more effect in increasing the supply of labor in this section than the slowing down of any other industry, as thousands of men laid off in the tire plants are seeking employment in other industries.

The Lucius Mfg. Co., Massillon, Ohio, has placed a contract with the H. K. Ferguson Co., Cleveland, for its new plant which will be a one-story brick, steel and timber building 100 x 260 ft., to be equipped with one and two-ton cranes. The plant will be used for the manufacture of tank bodies for automobile trucks, steel tanks for other purposes, truck bodies and general fabrication of steel. The officers of the company are C. B. Lucius, president and general manager; H. M. Dine, vice-president, and C. J. Richards, secretary.

The United Machine & Mfg. Co., Canton, Ohio, is planning the erection of a gray iron and semi-steel foundry, 100 x 200 ft., and will add to its present line of products. The company has made application to increase its capital stock from \$150,000 to \$550,000. L. E. Griffith is president.

The Canton Drop Forge Co., Canton, Ohio, is planning the erection of a new factory building, 95 x 100 ft.

The Timken Roller Bearing Co., Canton, Ohio, will erect a steel addition to its tube mill plant, 120 x 220 ft.

The Non-Ferro Foundry & Pattern Co., Toledo, Ohio, has acquired the plant of the M. De Mers Blacksmith, Tool & Machine Co. and will operate a foundry and pattern shop, making brass, bronze and aluminum castings and wood and metal patterns. The company, recently incorporated for \$10,000, has increased its capital stock to \$25,000. P. A. Gaynor is manager.

The Miami Tractor & Mfg. Co. has acquired a site at Celina, Ohio, where it plans to erect a plant.

The Hodes-Zink Co., Fremont, Ohio, manufacturer of automobile castings, has acquired a new site on which it will erect a plant 130 x 105 ft.

The Easiest Way Mfg. Co., Sandusky, Ohio, has purchased the plant of the Lake Erie Wine Co. and will remodel it for the manufacture of washing machines.

The Paramount Equipment Co., organized by Akron, Ohio, men, has purchased the Pioneer Pole & Shaft Works, Ashtabula, Ohio. It will be equipped for the manufacture of machinery used in the rubber tire industry.

New England

BOSTON, July 20.

Business, which appeared to show signs of activity a week ago, has flattened out again, most local machine tool interests reporting no new inquiries or prospects of importance. Efforts have been made to secure business under consideration by certain manufacturers for some time, but old prospects are cleaning up very slowly. No weakening of prices is noted, and according to common talk here, no reductions are expected for many months, at least. Less is heard of price cutting where competition for business is keen. Deliveries, generally speaking are no better and in some instances even more extended, eight months being the best that can be promised.

Within the immediate future the General Electric Co., West Lynn, Mass., is expected to close on a fairly large list of tools including lathes, shapers, radial drills, internal cutters for pinion work, and miscellaneous machines. The company has been figuring on abrasive grinder equipment, but has abandoned purchases, temporarily, at least. The Bethlehem Ship Building Corporation is closing on additional tools for its Fore River Works, Quincy, Mass. The Thurston Co., Providence, R. I., gear cutters, etc., practically cleaned up on its production equipment requirements. It contemplated the purchase of a backing-off machine, but abandoned the project for the time being. The Provi-

dence Engineering Co. of that city is asking prices on tools suitable for Ford rear axle work, but inasmuch as it has made no move on its other two lists few quotations so far have been made by local machine tool dealers.

The Boston & Maine Railroad Co., which was expected to close on the last of its specified machine shop equipments last week, has postponed action for another week. The United Shoe Machinery Corporation, Beverly, Mass., is inquiring on a few small planers, the Worcester Boys' Trade School on lathe equipment, the American Steel Foundries, Granite City, Ill., on automatic lathe equipment for turning test bars, and Jenkins Bros., Bridgeport, Conn., are in the market for a large engine lathe. The Simplex Tool Co., Woonsocket, R. I., has bought horizontal boring machine equipment, while the Fisk Rubber Co., Springfield, Mass., has closed on a bolt cutter. The Government bought a 4-in. boring mill with raising blocks for an experimental station in Texas. The Boston School Department has closed bids for two 15-in. lathes and has inquiries out for two wood-working tools. The Rollis-Royce Co. of America, Springfield, Mass., is about to close on a few odd tools. The company started machining operations about a week ago, and expects to be producing cars before the close of 1920. The Stevens-Duryea plant, Chicopee, Mass., is busy, as are all of the smaller New England automobile manufacturers, but they are not interested in new tools at the moment. Much interest is shown in the development of the proposed medium-priced car by the Locomobile Co., Bridgeport, Conn., but the company has nothing to give out for publication.

The demand for second hand machine tools is even quieter than that for new equipment. Raush & Lang, Inc., Chicopee, Mass., electrical equipment, shortly will issue a large list of second hand tools wanted, which will involve a sum of money running well into six figures. Local interest is shown in the public announcement by the Bridgeport, Conn., District Salvage Board, of the auction sale July 21 and 22 of a large number of machine tools and machine tool parts at the plants of the New England Westinghouse Co., East Springfield, Mass., and Chicopee Falls, Mass., and the Springfield Armory. Some of the machines are single purpose and limited in their use, while others are standard and adaptable to any use.

The Morgan Construction Co., Worcester, Mass., is still negotiating for a 10-ton crane, but new inquiries are few and far between. The Continental Paper Co., Bogota, N. J., has bought three 3-ton cranes.

The old cranes and runways serving submarine slips, Nos. 1, 2, 3 and 4, Bethlehem Ship Building Corporation, Ltd., Fore River Plant, Quincy, Mass., are being removed to make room for the erection of eleven new towers with the necessary runways, and the placing of two new 120-ft. span cranes. These cranes will have the same height as those on adjoining slips—110½ ft. above mean low water. They are to be used in connection with the company's new slip, No. 4, which has a concrete keelway 512 ft. long, designed for vessels of a maximum length of 520 ft., and 75 ft. beam, and has a clear width between towers of 105 ft.

The Hurlbut-Rogers Broaching Co., Hudson, Mass., broaching tools, is operating at capacity. The company, which is under the same management as the Hurlbut, Rogers Machinery Co., South Sudbury, Mass., for the past 45 years manufacturers of cutting-off machines and cutting-off and other tools, on May 1, leased the two-story Hudson plant it occupies, but owing to transportation difficulties was delayed in starting production until about three weeks ago. The plant turns out broaching tools of all makes for any make of machine. Many of its employees have made broaching tools for years, the superintendent exclusively so for the past 12 years. The company operates a specially developed hardening or heat treating furnace capable of maintaining heats within 2½ deg. Electric power is used, coal being necessary for heating purposes only.

A final certificate of dissolution has been filed at Hartford, Conn., by the Seymour Iron Foundry Co., Seymour, Conn.

Work has been started on a one-story, 21 x 46 ft. addition to the plant of the Waterbury Buckle Co., Waterbury, Conn.

All bids for the proposed building for the Park City Machinery Co., Bridgeport, Conn., were rejected. It is expected the plans will go out at a later date for refiguring.

The Economy Mfg. Co., Bridgeport, Conn., recently organized, is established at 716 First Bridgeport National Bank Building. The company has purchased land, 100 x 100 ft., on Brewster Street and has an option on another lot adjoining, where a new plant will be erected at some future date for the manufacture of spark plugs, tools and a newly patented adjustable wrench.

The New Haven, Conn., plant, Standard Steel & Bearing Co., Inc., formerly the Marlin-Rockwell Co., has been sold to the Safety Car Heating & Lighting Co. for approximately \$450,000. The purchaser manufactures Pintech gas and

other safety appliances for railroads and has a plant in Jersey City which will be moved to New Haven.

The Stanley Steel Welded Wheel Corporation, Boston, has purchased approximately 30 acres in North Tonaawanda, N. Y., for a plant adequate for turning out 1000 wheels per 8 hr. shift. The management has not completed the list of machine tools needed, but will be in the market at some future date for presses and cranes. The hubs are to be of sheet metal, stamped into shape and butt-welded, then flattened at the ends to enable them to fit accurately into the pockets and the rim and the hub. The final assembling of the parts is done by an automatic electric spot-welding machine. The management claims a wheel can be turned out complete every four minutes. James T. MacMurray, formerly with the Niles-Bement-Pond Works, Plainfield, N. J., and later with the Mead-Morrison Mfg. Co., East Boston, is president; James E. Sims, lately with the Becker Milling Machine Co., Boston, is assistant to the president; Arthur M. Stanley, the inventor of the wheel, formerly with the General Electric Co., West Lynn, Mass., is vice-president and chief engineer; Hon. Charles N. Fowler, Elizabeth, N. J., is vice-president; Irving McDowell Garfield, Boston, is vice-president and general counsel; and Samuel Eliot Guild, Jr., Boston, secretary and treasurer.

Harvey Hubbell, Inc., Lesbia Street, Bridgeport, Conn., manufacturer of electrical switches, plugs and kindred specialties, has filed plans for a one-story addition, 80 x 85 ft., with wing extension, 46 x 80 ft.

The General Motors Service & Truck Co., 554 Fairfield Avenue, Bridgeport, Conn., has completed plans for a one-story service and repair building, 110 x 120 ft., on Holland Avenue, to cost about \$75,000.

The Pullan & Hines Co., Pawtucket, R. I., has been incorporated at \$50,000 by J. Joseph Hines, James F. Pullan and George W. Morin, all of Pawtucket, to manufacture machinery and tools.

The Prest-O-Lite Co., 30 East Forty-second Street, New York, manufacturer of acetylene apparatus, automobile lighting equipment, etc., will take bids up to early in August for a new one-story plant, 25 x 100 ft., at Cambridge, Mass., to cost about \$80,000.

Fire, July 14, destroyed a portion of the plant of the Woburn Iron Foundry, Fowle Street, Woburn, Mass., with a loss estimated at about \$15,000.

The Petroleum Heat & Power Co., Stamford, Conn., will build a one-story addition to its plant to be equipped as a foundry.

The Lincoln Metal Products Co., Hartford, Conn., has been incorporated at \$50,000 by F. I. Davis and C. W. Gross, Hartford, and W. H. Weingar, West Hartford, to manufacture metal specialties.

The Crescent Die Co., 292 Eddy Street, Providence, R. I., has filed notice of organization to manufacture tools, dies, etc. Henry W. Dahl, 1216 Broad Street, heads the company.

Mercer Brothers, Nashua, N. H., have had plans prepared for a one-story automobile service and repair building to cost about \$50,000. Hutchinson & French, 6 Beacon Street, Boston, are architects.

Fire, July 15, destroyed considerable machinery, hoisting equipment and other mechanical apparatus at the plants of the Adamant Plaster Co. and Konold Coal Co., New Haven, Conn., with loss estimated at about \$25,000.

Landers, Frary & Clark, Inc., New Britain, Conn., manufacturers of cutlery, hardware, electrical cooking and heating specialties, etc., has been incorporated under New Jersey laws at \$6,000,000. The incorporators are C. M. Landers, L. O. Smith, H. E. Russell and others.

The Cave Welding Co., Springfield, Mass., has awarded a contract to Canning & Leary, Harris Building, New London, Conn., for a one-story plant addition.

The B. & H. Supply Co., Providence, R. I., has been incorporated at \$100,000 by Philip H. Barnett, Frank F. Mason, Pawtucket; and Albert M. Peterson, Providence, to manufacture tools, machine equipment, etc.

The New England Tire & Rubber Co., Holyoke, Mass., is planning for the erection of a large plant for the manufacture of automobile tires on Main Street, South Holyoke.

The New Haven Stove Repair Co., New Haven, Conn., has awarded a contract to Louis Winnik, New Haven, for a new one-story plant at 488 State Street, 24 x 100 ft., with extension, 12 x 24 ft., to cost about \$15,000.

The Boston & Maine Railroad Co., North Station, Boston, Mass., has awarded a contract to the H. Wales Lines Co., 134 State Street, Meriden, Conn., for an addition to its repair works at East Deerfield, Mass., one-story, 100 x 425 ft., including engine house, shop, etc., to cost about \$150,000.

The Norwich Nickel & Brass Co., Norwich Conn., has filed notice of dissolution.

The American Tube & Stamping Co., Bridgeport, Conn., contemplates the erection of a one-story addition, 40 x 160 ft.

The United States Motor Corporation has leased a two-story, 75 x 200 ft., public garage and repair shop, now being erected on Fordham Road, Allston, Mass.

The plant of the Mann Axe & Tool Co., St. Stephen, N. B., near Calais, Me., recently was destroyed by fire, with a loss estimated at \$100,000, principally on machinery and stock.

A. F. Way Co., Hartford, Conn., machinist and special tools, expects to be in its new East Hartford plant about Aug. 15. It is 54 x 129 ft., of mill construction.

The Corbin Cabinet Lock Co., New Britain, Conn., is extending some of its production departments by moving new and old machinery into the two new additions recently completed, which link up an entire hollow square of the plant.

The addition to the Bemis & Call Hardware & Tool Co., Springfield, Mass., held up for lack of building material due to transportation conditions, is nearing completion and should be in operation soon.

The Federal Corporation, Westfield, Mass., spark plugs, plans to add two new departments within 60 days, one for rim tools and the other for electric socket plugs. New capital has been added to the business and Fred E. Wells, Boston, made treasurer in place of C. W. Dodson, Boston, resigned. F. R. Speed, Springfield, Mass., formerly with the Packard Motor Co., is vice-president in charge of production. H. P. Linnell, Springfield, remains in active charge of the company's business. The head sales office of the company is in Boston.

Pittsburgh

PITTSBURGH, July 19.

Machinery and equipment market activities are still much restricted and the tendency to defer purchases is quite as marked as it has been at any time since the railroad transportation snarl developed and the banks began to curtail loans several weeks ago. The railroads would buy if they could secure funds, but such money as they are able to obtain from the revolving fund is being used more for the purchase of rolling stock than for shop equipment. Most of the steel companies in this district have plans for plant betterments, but few of them are moving toward the fruition stage. The Carnegie Steel Co. has plans ready for betterments at its Ohio works at Youngstown, but while appropriations have been asked for, they are yet to be granted. At the Donora, Pa., works of the American Steel & Wire Co., improvements involving a considerable outlay and the installation of much equipment are held up for the same reason, because the request for an appropriation has not been honored. The Jones & Laughlin Steel Co. is planning on a new sintering plant at its Woodlawn, Pa., works, and is expected to close for its construction and equipment shortly. No crane awards of any account recently have been announced here and inquiries are reported to be fewer. Builders are having considerable trouble in shipping because of the railroad situation and the shortage of cars. This complaint is common among Western makers on shipments east. The Carnegie Steel Co. has put out an inquiry for three punches and shears, a hydraulic press and a car wheel bending roll. Lathes, planers, drills, etc., sell fairly well from dealers' stocks, but orders for future delivery are much fewer than they have been and in some instances, where buyers have been able to buy a piece of machinery from stock, they have canceled orders.

The Standard Powder Co., Second National Bank Building, Pittsburgh, has acquired a large tract at Horrell, near Canoe Creek, Pa., comprising more than 200 acres, and plans for the erection of a plant, consisting of 25 one-story buildings, estimated to cost about \$1,000,000, with equipment.

The Eagle Pipe Supply Co., Inc., Woolworth Building, New York, has acquired the plant of the Metal Products Co., Beaver, Pa., for about \$85,000. The plant was used during the war for the manufacture of projectiles for the Government and will be converted by the new owner into a modern pipe mill. It consists of four one-story brick buildings on Fifth Street, 50 x 140 ft., 36 x 218 ft., 26 x 100 ft., and 30 x 40 ft. respectively.

Orders booked at the East Pittsburgh, Pa., works of the Westinghouse Electric & Mfg. Co. for the first quarter of the present fiscal year total \$41,000,000 as against \$16,000,000 for the corresponding period of last year. Production is

now being maintained on a basis of output of \$160,000,000 per annum in valuation.

The Heyl & Patterson Co., Inc., 50 Water Street, Pittsburgh, manufacturer of chains, machinery and parts, is having plans prepared for two additions to its plant at Johnstown, Pa., 100 x 264 ft. and 40 x 60 ft. respectively.

The Pittsburgh Malleable Iron Co., 34 Smallman Street, Pittsburgh, has acquired property, 120 x 160 ft., at Harrison and Fifty-seventh streets, for a consideration of \$36,000 cash. The site adjoins property acquired by the company some months ago from the General Chemical Co. for about \$300,000 and will be used for proposed expansion in operations.

Plans for a new one and two-story furnace building to cost about \$300,000, including equipment, have been completed by the American Window Glass Co., Jeanette, Pa. Headquarters of the company are in the Farmers' Bank Building, Pittsburgh.

The Bellevue Motor Service Co., Bellevue district, Pittsburgh, has acquired a one-story building at 15-17 Meade Avenue, Bellevue, on property 48 x 100 ft., to be used for a service and repair works.

The Meagley Torch Co., Pittsburgh, has been incorporated in Delaware at \$100,000 by Fred C. and William J. Tygard and Marke C. Meagley, Pittsburgh, to manufacture torches and other mine and mechanical equipment.

The Lucey Mfg. Co., Pittsburgh, pumps, engines, oil drilling tools and equipment, has arranged for a note issue of \$1,500,000, a large portion of the proceeds to be used for expansion at its different plants. Eastern offices of the company are in the Woolworth Building, New York.

The Donald Coal Mining Co., Connellsville, Pa., recently formed with William P. Stillwagon as head, has acquired about 190 acres of coal lands at Cheat Haven, heretofore held by the Piedmont Coal Co., for a consideration of \$289,500. The company will build a complete plant on the property, including power plant for works service, coal handling plant, etc., to cost about \$125,000. The site will be known as the Stillwagon mine.

The Urschel-Bates Valve Mfg. Co., Summit Street, Toledo, Ohio, has broken ground for a four-story plant at Oakmont, Pa., to cost about \$250,000, including equipment.

The Electric Reduction Co. and the Molybdenum Corporation, Washington, Pa., have been merged into one company with capital of \$5,000,000.

The Joiner-Jacobs Iron Works Co., Clarksburg, W. Va., has been incorporated with a capital of \$25,000 by Allen W. Joiner, John W. Jacobs and Frank C. Silkne, to manufacture iron and steel products, including machinery and parts.

The Opperman Coal Co., Blair, W. Va., has completed plans for the erection of a new steel tippie at its properties.

The Phelps Can Co., foot of Lawrence Street, Baltimore, Md., is taking bids for the erection of its proposed new plant at Clarksburg, W. Va., to comprise a one and two-story works, 75 x 100 ft.

The Fulton-Kenova Mine Car Co., Kenova, W. Va., manufacturer of coal cars, parts, etc., has increased its capital from \$450,000 to \$1,500,000.

Indianapolis

INDIANAPOLIS, July 19.

The Precision Machine Co., 1029 Superior Street, Indianapolis, has awarded a contract to Lynn B. Millikan, Lemcke Annex, for a one-story machine shop, 110 x 130 ft., to cost about \$15,000.

The Hummel Adding Machine Co., Indianapolis, has been incorporated in Delaware at \$1,000,000 by John J. Hummel, K. M. Weggamp and Frank A. Forkner, to manufacture calculating machines.

The Wawasee Tire & Rubber Co., Elkhart, Ind., manufacturer of automobile tires, is planning a three-story plant, 50 x 175 ft., at Syracuse, Ind.

The City Council, Anderson, Ind., has completed plans for the proposed municipal electric light and power plant, estimated to cost about \$300,000. J. Essington is city clerk.

The power plant, forge shop and other buildings of the Hartwell Coal Mining Co., Hartwell, near Goshen, Ind., were destroyed by fire, July 11, with loss estimated at about \$45,000.

The Arex Co., Conway Building, Chicago, manufacturer of ventilators and kindred metal products, has awarded a contract to J. Belch, 671 West Forty-third Street, Gary, Ind., for a one-story plant at 4024-34 Broadway, Gary, 50 x 150 ft., to cost about \$22,000.

The Dudlo Mfg. Co., Fort Wayne, Ind., wife products,

coils, etc., has filed plans for a one-story building at its plant on Wells Street, 50 x 160 ft., to cost about \$12,000.

The power plant of the Chicago, South Bend & Northern Indiana Railway Co., at Dunlaps, near Goshen, Ind., was destroyed by fire, July 9, with heavy loss. The plant will be rebuilt.

The No Man Top and Body Co. has been incorporated at Indianapolis, with \$250,000 capital stock, to manufacture automobile accessories. The directors are William Kootz, Heinrich Rhode and Edward M. Ragland.

The Pioneer Brass Works, Indianapolis, has taken out a permit for a new building at Twenty-third Street and the L. E. & W. Railroad tracks, to cost \$60,000. It will be 150 x 200 ft. The present plant is at 424 South Pennsylvania Street. With the new building the capacity of the plant will be trebled.

The Hendricks Magneto & Electric Co., Indianapolis, has increased its capital stock to \$85,000.

The General American Tank Car Co., East Chicago, Ind., is building an addition to its brass foundry to cost \$15,000 and a repair car shop to cost \$10,000.

Fire at the plant of the Indiana Milling Co., Terre Haute, July 17, caused a loss, including that on machinery, of \$300,000. Fred M. Kuhn is vice-president of the company.

The Indiana Atomized Fuel Co. will erect a plant at Evansville, Ind., to cost \$150,000. The company will manufacture atomized coal.

The Markle Water Co. has been incorporated at Markle, Ind., at \$30,000, to supply water for domestic consumption. The directors are Ed. Saurer, H. A. Boyd and E. E. Youse.

The Carroll Castings Co., East Chicago, Ind., has bought a tract on the Indiana Harbor Belt Railroad as the site for its plant. The company has \$250,000 capital stock and will manufacture small gray iron castings.

The Caldwell & Drake Iron Works, Columbus, Ind., has completed enlargement of the foundry and the installation of new cranes and new power equipment.

The Pioneer Automobile Truck Co., Chicago, has closed a deal for a site for a factory at Valparaiso, Ind., to be 100 x 300 ft., one story, Monitor type. The company has leased temporary quarters until the new building is erected.

The Obenchain-Boyer Co., Logansport, Ind., manufacturer of chemical fire fighting apparatus, has increased its capital stock from \$250,000 to \$1,000,000.

The Braude-Pierce Furniture Co., organized at Warsaw, Ind., at \$100,000, has taken over the plant of the Warsaw Wood Products Co. and will erect a new building. The officers are: J. Edward Headley, president; E. Braude, vice-president, and Wesley I. Pierce, secretary-treasurer.

The Universal Air Compressor Co., Indianapolis, has increased its capital stock from \$20,000 to \$70,000.

The Gray Iron Casting & Foundry Co. has been incorporated at Marion, Ind., at \$50,000. The directors are Mark E. Savesky, Myer Savesky and Jack C. Kingsland.

The Hercules Mfg. Co. has been incorporated at Indianapolis, at \$400,000, to manufacture electrical machinery. The directors are Jackson Carter, E. M. McDaniel and W. L. Taylor.

Cincinnati

CINCINNATI, July 19.

Machine-tool manufacturers report a fair amount of new business during the week. Buying for the most part continues to be for reasonably early delivery. Machinery dealers with a stock of second-hand tools report that business is good with them. Quite a lot of prospective buying is being held up, according to dealers, and some cancellations from automobile parts manufacturers are being received. The aggregate value of cancellations has not reached a large sum, indicating that the machine tool industry is in a healthy condition and that tools ordered are actually needed. The Chesapeake & Ohio Railroad is expected to complete its purchases this week and at least part of this business will be placed in the local market. No large inquiries are being figured on. Several crane inquiries are before the trade. The Hamilton Furnace Co., Hamilton, Ohio, has closed for a 10-ton Niles crane, 60-ft. span.

The Cincinnati Buffing & Machining Co., Cincinnati, has been incorporated with a capital of \$10,000 by A. H. Harvey, A. W. Harvey, G. B. Lindsley and L. P. Lindsley, and will engage in the buffing and polishing business and also metal stamping. The plans of the company are not as yet complete, but it is expected that within the next two weeks they will have secured a plant and commenced operations.

The Campbell-Hausfelt Co., Harrison, Ohio, a merger of the Campbell Co. and the Hausfelt Co., has been organized

with a capital of \$200,000. The company will continue the manufacture of the Hausfelt line of melting furnaces and the Campbell line of corn drills. Edwin B. Hausfelt is president, Albert Campbell, vice-president and C. E. Haddock, secretary. The company has recently purchased new machinery and is now in a position to greatly increase its output. A gray iron foundry is also operated in connection with the plant.

Foundation work has been completed and all the electrical equipment has been received for the installation of an electric furnace at the plant of the Cincinnati Steel Castings Co., Cincinnati. It was expected that this furnace would be in operation about the first of June, but the non-delivery of the furnace itself has delayed the installation so that it is expected that it will not be ready until about Sept. 1.

It is announced that the plant of the Carroll Foundry & Machine Co., Bucyrus, Ohio, has been sold to Cleveland parties. The Carroll company was capitalized at \$242,000.

The United States ordnance plant at Edgemont, near Dayton, Ohio, which was recently offered for sale, is still on the market as no bids were received for it. The property consists of a four-story brick and frame building and 2¼ acres of ground and is valued at about \$400,000.

Construction work has been started on the plant of the Miami Tractor Co., Celina, Ohio. The contract provides for a building containing 20,000 sq. ft. of floor space and costing about \$50,000. The plant will be in operation next fall.

It is understood that the Quick Change Chuck Co., Arcanum, Ohio, is contemplating the erection of a new building, 80 x 100 ft., one story, to take care of its increasing business. It is expected that machinery will be installed and production work started by the middle of September.

The foundry of the Xenia Foundry & Machine Co., Xenia, Ohio, commenced operations July 9. The company will make a specialty of gray iron castings and sufficient orders to keep it running for several months have already been received from manufacturers in Dayton, Cincinnati and Detroit. W. M. Huston and Ernest Pester are the leading stockholders.

The Buob & Kimmeler Machine Co., Post Square, Cincinnati, has purchased a four-story building, formerly owned by the Razall Printing Co., and will occupy it after a few alterations are made.

Detroit

DETROIT, July 19.

The Columbia Motors Co., of Detroit, has purchased land for a new plant on West Jefferson Avenue, with the River Rouge on one side and the Michigan Central Railroad on the other. The plant will consist of a number of large units and will eventually employ 2000 to 3000 men.

The new malleable foundry of the Superior Steel Castings Co., Benton Harbor, Mich., will be ready for occupancy by Sept. 1. About 200 men will be employed. Castings for agricultural tools and automobile parts will be made. The plant under construction is 200 x 360 ft., of brick and steel. The company is constructing a gray iron plant at La Porte, Ind.

The Lansing-Nash Co., of Lansing, Mich., is preparing to erect a building to cost \$40,000.

Work is under way on a new building, to be used as the test department of the new unit of the Reo Motor Car Co., Lansing, Mich. It is one story, with basement, 60 x 192 ft. The latest electrical equipment will be installed in the new test department building.

The Benton Harbor Malleable Foundry Co., Benton Harbor, Mich., has placed an order with the Bonnet Co., Canton, Ohio, for the installation of a powdered coal plant, which will be used both in melting and annealing, to cost about \$150,000. The building to house this plant will be erected on the site of the present buildings of the Crary Machine Works, which were recently purchased from the Crary Co. by the Benton Harbor Malleable Foundry Co. The latter company is completing a new foundry, 60 x 240 ft., with a wing 60 x 80 ft.

The E. A. Nelson Automobile Co., Detroit, is reported to be seeking a factory site in Romeo, Mich., which is just outside Detroit, and to have started negotiations for a site along the Grand Trunk Railway tracks. It is planned to erect a plant which will employ 200 men and build 2000 cars annually.

David Buick, founder of the Buick Motor Co., Flint, Mich., announces that his plant at Wyandotte, Mich., will begin the manufacture of David Buick carbureters on Sept. 1.

At a recent meeting of stockholders of the Andrix Lock-Nut Co., Adrian, Mich., President Andrix announced that the factory would be in operation within the next 90 days.

The Albion Foundry & Machine Co. has been organized at Albion, Mich., with a capital stock of \$100,000 to make grey iron castings and do machine work. A. C. Hudgett is president and manager.

The Calumet Motor Co. has been organized at Calumet, Mich., to build small engines, with a capital stock of \$100,000. Ocha Potter, Houghton, Mich., is president.

The Benton Harbor Forging Co., Benton Harbor, Mich., has placed an order for two 2000-pound Chambersburg board drop hammers, for delivery in the early winter.

Much of the steel for the new machine shop of the General Motors Truck Co., Pontiac, Mich., has arrived and construction is being pushed rapidly. The building will contain 140,000 sq. ft. and will enable the company to increase its output to 25,000 trucks during the coming year.

Several of the large hammers, motors and other equipment for the Federal Drop Forge Co., Lansing, Mich., have been installed, and more equipment is in transit. Production is expected to start Aug. 1.

The Standard Castings Co., Lansing, Mich., has resumed operations after having been forced recently to suspend on account of damage by fire. The plant has been overhauled and considerable new equipment ordered. The company is installing a new heating plant and other additions.

The city of Harbor Springs, Mich., has approved a proposal for bonding the city for \$30,000 to build a plant for the Higrade Motors Co., manufacturer of the Higrade truck.

During the last two weeks the Atlas Drop Forge Co., Lansing, Mich., has been overhauling its plant and equipment. Manufacturing was virtually suspended, while the whole working force was engaged on the job. The new addition is nearing completion and will be equipped as a heat treating plant. Parts of the new furnaces are being made in the company's own plant.

The Detroit Insulated Wire Co., 641 Wesson Avenue, Detroit, has awarded a contract to A. W. Kutsche, Ford Building, for a one-story addition.

The American Broach & Machine Co., Ann Arbor, Mich., has filed plans for a one-story plant, 59 x 250 ft., to be equipped for the manufacture of broaching machines and other equipment.

The Upton Machine Co., St. Joseph, Mich., has awarded a contract to Charles E. Kingsley, St. Joseph, for a one-story machine shop to cost about \$75,000.

The Sauzedde Mfg. Co., Mt. Clemens, Mich., has completed plans for a new one-story plant, 100 x 150 ft., to be used for the manufacture of automobile parts and kindred equipment. Hugh T. Miller, 320 Lightner Building, Detroit, is architect.

In connection with the new manual arts school to be erected at Kalamazoo, Mich., by the State Board of Education, Lansing, a machine works and foundry will be installed, with woodworking shops and other departments, devoted primarily to automobile construction and repair work. It will be two-story, 95 x 250 ft. T. E. Johnson is secretary of the board. H. H. Turner, Michigan Trust Building, Grand Rapids, is architect.

The General Necessities Corporation, 271 Grand River Avenue, Detroit, has filed plans for a one-story machine shop and metal working plant, 52 x 107 ft., at Mount Elliott and Beaufait avenues, to cost about \$12,000.

The Jefferson Forge Products Co., 2811 East Jefferson Avenue, Detroit, has filed plans for a one-story forge shop addition, 40 x 120 ft., to cost about \$50,000.

The City Council, Durand, Mich., is planning for a new municipal light and power plant to cost about \$50,000. R. A. Murdock, Free Press Building, Detroit, is engineer.

The Detroit Tool Co., 1487 St. Antoine Street, Detroit, has filed plans for a two-story addition, 60 x 120 ft., including a new power department.

The Detroit Casket Co., 185 Congress Street, Detroit, is having plans prepared for a three-story, brick and reinforced-concrete plant, 115 x 150 ft., to cost about \$100,000.

Milwaukee

MILWAUKEE, July 19.

Machine tool business, as viewed by local manufacturers and dealers, appears to be largely a question of deliveries. Although large lot requirements are generally absent, there is a steady flow of small orders for replacement and to piece out equipment, but buying is limited mainly to the ability of makers to place tools into the hands of purchasers. This is extremely difficult under existing railroad

traffic conditions, in the case of the large manufacturing communities, where congestion now is perhaps at its worst stage. However, the movement is relatively free to localities off the main trunk lines and a good business is being done with buyers in these centers. Some improvement is discerned locally in deliveries to New England, but great obstacles are in the way of placing machines in hands of buyers in such congested communities as Pittsburgh and Cleveland. Production is being well maintained, as local shops keep well sold up and ahead on some types.

The Wisconsin Valley Electric Co., Wausau, Wis., is starting work on the first unit of a large hydroelectric project on the Wisconsin River at Big Bull Falls, which involves an immediate investment of about \$450,000. The bulk of the machinery and equipment has been contracted for. L. A. DeGuere, Grand Rapids, Wis., is consulting engineer. The steel work for the generating plant has been placed with the Federal Bridge & Structural Co., Waukesha, Wis., and amounts to 125 tons.

The Van Brunt Mfg. Co., Horicon, Wis., manufacturer of drills, seeders and other agricultural equipment, will increase the capacity of its works about 75 per cent by the erection of a brick and steel foundry addition, 80 x 200 ft.; a large shop extension, 50 x 90 ft.; a malleable and steel storage building, 40 x 150 ft., and a five-cell dry kiln addition, 30 x 90 ft. It also has under consideration plans for a steam generating plant addition, 50 x 60 ft. The work will require from 200 to 230 tons of structural steel, to be fabricated and erected by the Federal Bridge & Structural Co., Waukesha, Wis. The Van Brunt company is a member of the John Deere group of agricultural implement industries. Fred H. Claussen is president and general manager of the Horicon works.

The Gerlinger Steel Casting Co. and the Gerlinger Electric Steel Foundry Co., West Allis, Milwaukee county, have been consolidated under the name of Gerlinger Electric Steel Casting Co., with authorized capital of \$500,000. A trust deed has been given the First Wisconsin National Bank of Milwaukee to secure an issue of \$300,000 first mortgage serial gold bonds maturing at the rate of \$30,000 per annum from 1926 to 1935. Besides the erection of a brick and steel foundry building, 80 x 400 ft., the Gerlinger companies within the past year also acquired adjoining property of two and one-half acres, with buildings that have been converted into pattern shop, storage and other auxiliary buildings. The Gerlinger works are located at Sixtieth and National avenues. Walter Gerlinger is secretary.

The Interstate Drop Forge Co., Milwaukee, commenced regular operation of its new works at Twenty-seventh and Lake streets on July 14, with due ceremonies. The first forging was made by S. M. McFedries, vice-president and general manager. The company will specialize in forgings for the automotive industries and has orders on the books to keep the plant busy four to six months.

The Allen-Dieffenbaugh Wrench & Tool Co., Baraboo, Wis., has been incorporated at \$100,000 and will engage at once in the manufacture of patented mechanics' tools. A building has been leased and machinery is being purchased. Materials for an initial production of 10,000 wrenches, beginning Sept. 1, has been contracted for. A. C. Allen, formerly of Chicago, is president of the company and in personal charge of the operation.

Adolph Neunast and George Sweet of Merrill, Wis., have formed a partnership and are establishing a commercial machine and repair works at 119 South Foster Street.

The Acme Motor Parts Corporation, 355 East Water Street, Milwaukee, which recently increased its capital stock from \$50,000 to \$100,000, will either purchase an existing building or erect a new machine shop during the coming fall, providing 5000 sq. ft. It manufactures magneto and generator couplings, special tools, jigs, dies and other mechanical devices designed for the automotive industries. When the proposed new shop is occupied it will put in production a universal joint for motor vehicles. W. S. Smulski is president and general manager.

The Fox River Tractor Co., Appleton, Wis., organized a year ago with a capital stock of \$200,000, erecting at that time a one-story machine shop, 36 x 72 ft., has completed its experimental work and is preparing to start manufacturing tractors in quantities about Aug. 15. A one-story shop addition, 36 x 50 ft., is under construction, and additional shifts will be erected during the fall and winter. Purchases of new equipment are being made from time to time in single or small lot orders, as required. Ervin Saiberlich is works manager.

The Milwaukee County Board of Supervisors, W. E. McCarty, chairman, has selected plans prepared by Van Ryn & DeGelleke, architects, Caswell Block, Milwaukee, for the proposed county hospital at Grand Avenue, Twenty-fourth to Twenty-fifth streets, estimated to cost \$2,000,000. De-

tailed plans and specifications have been ordered and will be ready for bidders about Jan. 1, 1921.

The Acme Gas Mixture Mfg. Co., Superior, Wis., has been incorporated at \$100,000 to manufacture and deal in gasoline engines, parts, accessories and supplies. It intends to establish a machine shop for producing auxiliary carburetion devices for internal combustion engines. The incorporators are Edward P. Johnson, Charles Kronlund and Carl A. Peterson, all of Superior.

The Milwaukee Terminal Co., 148 Broadway, Milwaukee, Wis., has awarded contracts for a four-story building, 125 x 440 ft., as an addition, duplicating the present dock, warehouse and manufacturing building at Erie Street and the Milwaukee River, occupied by the Chicago, Racine & Milwaukee Steamship Line and a number of manufacturing concerns. The Thompson-Starrett Co., 175 West Jackson Boulevard, Chicago, is general contractor, and has sublet the steel work to the Duffin Iron Co. The architect and engineer is A. S. Hecht, 64 West Randolph Street, Chicago.

The Gilson Mfg. Co., Port Washington, Wis., founder, machinist and manufacturer of gasoline engines, tillage tools and furniture and chair hardware, has broken ground for a one-story machine shop, 60 x 200 ft., and a warehouse and garage building, 40 x 200 ft. The work will cost about \$90,000. Harry W. Bolens is president and general manager.

The Northern Peshtigo Power Co. and the Northern Peshtigo Pulp Co., Green Bay, Wis., have been incorporated separately, each at \$1,000,000, by V. J. Kelliher, A. T. Pamperin and T. S. Pamperin, Green Bay, to establish and operate respectively a hydroelectric generating plant and a pulp and paper mill on the Peshtigo River. All of the promoters are prominent in the light, power and paper manufacturing industries in northern Wisconsin.

The American Rotary Engine Co., Grand Rapids, Wis., is the name of a new corporation organized at \$200,000 by I. P. Witter, D. B. Phillee and J. A. Cohen, to manufacture engines, pumps, compressors, motors, etc.

The Hartford, Wis., Common Council is asking bids for furnishing and installing a chain and pocket type coal elevator to serve a new boiler house being erected and equipped at the municipal steam generating plant. Bids close July 20. William Radke is city clerk.

The Gilbert Paper Co., Menasha, Wis., has let the general contract to C. R. Meyer & Sons Co., Oshkosh, Wis., for a one-story, fireproof machine room, 65 x 135 ft., and a one-story finishing building, 82 x 140 ft., costing about \$150,000, with new equipment.

The Superior Auto Signal Co., Superior, Wis., has been incorporated at \$10,000 to manufacture metal automotive accessories and devices, by H. M. Mark, R. H. Gorusch and Bert Karon, all of Superior.

The Manitowoc Shipbuilding Corporation, Manitowoc, Wis., has been organized under the laws of Wisconsin with an authorized capitalization of \$1,500,000 by A. L. Nash, Lawrence W. Ledvina and E. L. Nash, attorneys of Manitowoc, to do a general shipbuilding, dry dock and dockage business. The new corporation is formed by interests which have acquired the bulk of the property of the Manitowoc Shipbuilding Co., a member of the American Shipbuilding Co. group, which has completed its Government contracts and will make disposition of its properties.

The Milwaukee Board of Industrial Education, 62 Mason Street, Milwaukee, is asking sealed bids until July 29 for furnishing, delivering and placing precision bench lathes, chucks, screw cutting attachments, laboratory furniture and other machinery in the new Central Continuation School, Prairie and Seventh streets. The bulk of the tool equipment has been acquired from the surplus property division of the War Department. Fred French is secretary of the board.

The Milwaukee Ever Tight Co., Milwaukee, has been incorporated at \$10,000 to manufacture automotive parts and specialties. The incorporators are Lysander B. Armstrong, James P. McGuigan, 425 East Water Street, and J. L. O'Connor, attorney.

The LeRol Co., Milwaukee, manufacturer of internal combustion engines for passenger and commercial cars and tractors, has increased its authorized capitalization from \$350,000 to \$700,000. The corporation was formed about four years ago to take over the gas engine business developed by the Milwaukee Machine Tool Co. The works at Sixtieth and Mitchell streets has been in process of enlargement for the past year and further extension will be carried forward gradually. C. W. Pendock is president and chief engineer and Charles B. Tamm is chief purchasing agent.

The Stewart Tractor Co., Waupaca, Wis., manufacturer of gas and kerosene tractors, is establishing a department for quantity production of trailers with steel frames, double end couplings, etc., for tractor haulage in train or individually.

The Ford Motor Service Co., Fond du Lac, Wis., will build a two-story brick and concrete addition, 52 ft. sq., to be equipped as a machine and repair shop.

The Milwaukee Boiler Mfg. Co., Milwaukee, has filed articles of incorporation. The capital stock is \$200,000 and the incorporators are I. M. Bean, Otto A. Ehbe and W. D. Johnson, principal stockholders and officers of the Milwaukee Boiler Co., 220 Oregon Street. A statement concerning the new organization will be issued shortly, according to W. D. Johnson.

The Badger Brass Co., 243 Lake Street, Milwaukee, sustained a loss of about \$6000 by fire on July 15. The Mertes-Miller Boiler Works, 239 Lake Street, also suffered considerable damage. Repairs and replacements will be made at once.

The Milwaukee Commercial Auto Body Co., 1829 Galena Street, Milwaukee, has incorporated its business under the original style, with a capital stock of \$25,000. The principal owners are Morris Schuster, Isador Schuster and Hyman Pearlmut.

The Wood County Rural Electric Co., Vesper, Wis., has been incorporated at \$100,000 to build, operate and maintain electric light, power and heating utilities in Wood and Portage counties. The incorporators are W. W. Clark, Fred Piltz, Anthony Zimmerman, Charles Korn and John K. Blonien.

The Waukesha Malleable Iron Co., Waukesha, Wis., has resumed operations after a brief interruption to facilitate the transfer of the plant and business to the General Motors Corporation. It will serve both the Samson Tractor Co. at Janesville, Wis., and the Buick Motor Co., at Flint, Mich., with malleable castings. James A. Craig, president Samson Tractor Co., will have charge of the works, with John Enders, formerly secretary of the Waukesha company, as resident manager. John E. Haertel is retained as general superintendent. A. J. Baldwin, heretofore in charge of laboratory work, is given supervision of plant maintenance and construction.

The Pacific Northwest

SEATTLE, July 13.

Rail transportation continues to hamper industry, particularly lumbering. The present car shortage for lumber uses is more serious than it has been for several years.

Every condition points to a satisfactory crop for 1920 in the Pacific Northwest, and farming and harvesting equipment has been particularly active all during the spring and summer. A slight shortage of farm labor has been felt, but it is expected that any shortage will be more than made up by the closing of lumber camps on the coast, and the release of thousands of camp workers.

The Northwest Bridge & Iron Works, Portland, has closed contracts recently for seven oil tankers for Canadian interests. The ships will be of 12,000-ton capacity, and the plant will employ 5000 men.

The Multnomah Truck Co., Vancouver, Wash., has completed plans for a factory building, 60 x 168 ft., one story. The plant will manufacture two lines of trucks. Other units will be added from time to time. Robert E. Cavette is president.

The Central South

ST. LOUIS, July 19.

The American Set Screw Co., 939 South La Salle Street, St. Louis, is taking bids for a two-story plant, 50 x 100 ft., at Tenth and La Salle streets, to cost about \$40,000.

Citizens at Marshall, Mo., have approved a bond issue of \$90,000 for the establishment of a municipal power plant, to be operated in conjunction with a waterworks system.

The Nashville, Chattanooga & St. Louis Railway Co., Nashville, Tenn., is planning for railroad construction and repair shops at Hollow Rock, Tenn.

R. R. James, Cotton Plant, Ark., has organized a company to construct a hydroelectric power plant on the Little Red River, Cleburne and White counties, to cost about \$3,000,000. Plans are now being prepared by Dickinson & Watkins, engineers, Little Rock, Ark. The proposed plant will have an initial generating capacity of 16,500 kw., with transmission and distributing system covering a district of about 130 miles.

The Famous Stove Co., Piggot, Ark., has been incorporated at \$20,000 by T. W. Johnson, A. B. Gallegly and F. B. Sprague to manufacture stoves, ranges, etc.

The cotton ginning and oil plants of the Farmers' Cotton Oil Co., Lone Wolf, Okla., were destroyed by fire, July 3 with loss estimated at about \$45,000.

The Planters' Staple Iron Co., Slater, Miss., has been incorporated at \$10,000 by E. T. Lott and J. H. Johnson to manufacture iron and steel products.

The Dixie-Belle Refining Co., Inter-Saw Building, Louisville, is planning a new oil refinery on the Western Parkway, with estimated cost of about \$500,000.

The Dixie Rubber Co., 770 Randolph Building, Memphis, Tenn., has awarded a contract to the Alexander Construction Co., Memphis, for the first unit of its proposed automobile tire manufacturing plant, estimated to cost about \$175,000. Other plant units to form the complete works are estimated to bring the total investment to \$1,000,000. L. C. Cadenhead is vice-president and general manager.

The Southern Equipment Co., Laurel, Miss., has been incorporated at \$10,000 by J. M. Calhoun and R. J. Coffman, to manufacture iron and steel castings.

The Alabama Coal Co., Tulsa, Okla. (Box 1934), recently organized, is planning for a coal tippie.

The Missouri Pacific Railroad Co., St. Louis, is planning for a one-story car repair shop, 40 x 200 ft., at Paragould, Ark. H. R. Carpenter is chief engineer.

The Myers Stave & Mfg. Co., Piggott, Ark., is planning for a plant to cost about \$40,000, comprising a main factory, 80 x 80 ft., with power house, 40 x 60 ft. J. R. Myers is manager.

The Gulf States

BIRMINGHAM, July 19.

Contract for a gas storage house, 200 x 400 ft., of sheet steel, a settling basin and piping for water supply for the United States helium production plant at Fort Worth, has been awarded to the Reagan Construction Co., Baltimore. Echols Brothers, Fort Worth, have been given the contract for concrete gig boxes for the pipe line to Petrolia which was completed some time ago. Lieut. I. P. Griffin, U. S. N., is in charge of construction.

The Houston, Bay Shore & Texas City Traction Co., Houston, recently incorporated at \$300,000, will build an interurban line from Houston to Harrisburg, thence down the ship channel along a line half way between the county road and the channel. Stations will be built at every wharf, refinery and industrial plant along the route to Texas City. Ed Kennedy is president of the company; S. D. Simpson, vice-president; J. S. Bracewell, general counsel, and C. E. Truelove, secretary.

An addition, to cost \$300,000, will be built to the assembling plant of the Ford Motor Co., at Houston.

The Oil City Iron Works has been incorporated at Corsicana at \$60,000. Incorporators are W. M. Clarkson, Sr., W. M. Clarkson, Jr., and S. E. Kerr.

Wharton Motors Co., Wilmington, Del., has been granted a permit to do business in Texas, with headquarters in Dallas. Capital stock is \$5,000,000. E. H. Wharton is agent.

Sanger Oil and Refining Co., Wilmington, Del., has been granted a permit to do business in Texas, with headquarters at Dallas. Capital stock is \$1,500,000. J. R. Sanger is agent.

Johnston & Davidson, American bankers at Chihuahua, Mexico, have leased the rich silver property of San Pedro, located 30 kilometers east of the railroad from Jiminex to Parral. The new owners will begin development operations at the property at once.

The Iron City Pipe & Fittings Co., Birmingham, Ala., has inaugurated operations at its new plant at North Birmingham for the manufacture of sanitary pipe and fittings. It is proposed to develop a capacity of about 30 tons a day and this will be increased at a later date.

The Acadia Iron Works, Crowley, La., is planning for a one-story addition.

Fire, July 1, destroyed the machine shop and adjoining building at the plant of the Texas Co., Port Neches, Tex., with loss estimated at about \$125,000, including equipment. Local district offices are at Houston, Tex.

The St. Louis Southwestern Railroad Co., Tyler, Tex., is planning for the immediate construction of a new yard and engine terminal at Hodge, Tex., to cost about \$225,000. The works will include a one-story car repair shop, coaling station, with 50-ton mechanical coal chute, engine house and engine repair shop, and other structures.

J. V. Daniels, Lubbock, Tex., is planning a new five-stand cotton ginning plant.

The Rylander Co., Sixth Street and East Avenue, Austin, Tex., recently incorporated, is planning for a new plant for the manufacture of cottonseed machinery. The company

will increase its capital to \$500,000 to provide for erection and machinery purchases. J. B. Rylander is head.

The Natural Fertilizer Co., Fernandina, Fla., recently organized with a capital of \$500,000, is planning for a fertilizer manufacturing plant at St. Augustine, Fla. I. B. Brussells is president and D. N. Chadwick, Jr., secretary and treasurer.

The Cotton Belt Railway Co., Houston Street, Fort Worth, Tex., is planning for the immediate erection of a new local engine house, with shop and repair department, to cost in excess of \$100,000.

The Oil City Iron Works, Inc., Corsicana, Tex., has been incorporated at \$60,000 by W. M. Clarkson, Sr. and Jr., and S. E. Kerr, to manufacture iron and steel products.

The Southern Manganese Corporation, Anniston, Ala., has arranged for a bond issue of \$500,000, to be used for proposed additions and improvements.

The Oil City Brass Works, Beaumont, Tex., is planning for a new plant.

The Bagby Elevator & Electric Co., Birmingham, Ala., has been organized to manufacture electric elevators and other iron products. A. P. Bagby and D. T. Blake head the company.

The City Council, San Antonio, Tex., is planning for a new machine shop and automobile service works to be used for municipal automobiles. H. Helland, city engineer, is in charge.

The Hills-Sutton Co., El Paso, Tex., has completed plans for the first unit of its proposed new plant, to be equipped for the manufacture of sheet metal products. The building, exclusive of equipment, will cost about \$10,000.

California

SAN FRANCISCO, July 13.

The Western Auto Electric Co., Los Angeles, has completed plans for a two-story works, 141 x 155 ft., at the corner of Sixteenth and Hope streets.

The West Coast Rubber Co., Los Angeles, has been incorporated at \$100,000 by S. Isabe, I. Wada, and Charles L. Larzellere, to manufacture automobile tires and other rubber products.

Fire, July 6, destroyed the plant of the Burlingame Vulcanizing Co., Burlingame, Cal., with loss estimated at \$15,000.

The Harbor Commission, Los Angeles, has instructed City Engineer Griffin, acting as chief engineer for the commission, to prepare specifications for the purchase of a new locomotive crane, derrick barge with hoisting machinery, drill press and lathe, and other equipment.

The Moyle Machinery & Products Co., Los Angeles, has been incorporated at \$2,500,000 by E. H. Moyle, A. P. Garner, F. R. Galbraith and George Renwick, to manufacture machinery for oil and mineral land work, parts, etc.

The Owensmouth Machine Works, Owensmouth, near Los Angeles, has filed notice of organization to manufacture machinery and parts. Edward McKain, 1020 Normandie Avenue, Los Angeles, heads the company.

A. V. Slater, Los Angeles, has awarded a contract to M. Stepan, Los Angeles, for a one-story brick machine shop at 1968 South Los Angeles Street, 50 x 135 ft., to cost about \$12,000.

The Hutchinson Motor Car Co., Santa Paula, Cal., has filed plans for a one-story service and repair building on North Mill Street, 50 x 140 ft.

The Pacific Gas Radiator Co., Los Angeles, manufacturer of heating equipment, has increased its capital from \$25,000 to \$100,000.

The Parker Iron Works, San Bernardino, Cal., has filed plans for a one-story shop addition at its plant.

The United States Compressed Inner Tube Tire Co., Tulsa, Okla., is considering the erection of new plant at Long Beach, Cal. A site is now being selected. The proposed plant is estimated to cost in excess of \$500,000, including equipment. M. C. Hale is president.

The Cannon Electric Development Co., Los Angeles, has been incorporated at \$20,000 by James H. Cannon, 4034 Homer Street; John F. Torrey and Byron L. Marvel, to manufacture electric appliances and equipment.

The Edison Electric Appliance Co., Ontario, Cal., manufacturer of electric heating and cooking equipment, has filed plans for an addition to its plant to cost about \$25,000.

The Union Oil Co., Union Oil Building, Los Angeles, has completed plans for four new buildings at its oil works on Parker Avenue to cost about \$62,000. Peter Powelson is construction manager.

The Witmer Brothers Co., Wright & Callender Building, Los Angeles, has filed plans for a one-story machine works, 40 x 135 ft., at 1282 West Second Street, to cost about \$10,000.

The Coast Motor Co., Los Angeles, has been incorporated at \$300,000 by Richard H. Magoon, John K. Porter and James G. Cassou, to manufacture automobile equipment, parts, etc.

The Stragivara Phonograph Co., Portland, Ore., has been incorporated in Delaware, at \$4,000,000 by M. M. Matthiessen, Richard W. Montague and F. H. Clark, all of Portland, to manufacture talking machines and parts.

Canada

TORONTO, ONT., July 19.

For the past several weeks it has appeared likely that Toronto, Ont., would lose the plant of Baldwin's Canadian Steel Corporation, because of the hydro-power shortage. It is now announced that all difficulties in regard to power have been overcome, and construction work on the mill at Ashbridges Bay, Toronto, which was stopped two or three months ago, will now be resumed. The company is already receiving some 1500 hp., from the Hydro Electric Power Commission, for its electric furnaces, but it will require 10,000 or 15,000 hp. more when the plant has been completed and is operating to capacity.

It is announced that the plant of the Steel Co. of Canada, Hamilton, Ont., which has been closed down for two weeks on account of the shortage of fuel, has now secured a supply of coal and oil and will open up at least a part of its plant immediately. So far the company has been unable to secure full supplies of fuel and until it does there is little chance of the entire plant being put in operation.

The Shade Mfg. Co., Ltd., Edmonton, Alta., has secured an option on a large warehouse in Owen Sound, Ont., and it is the intention to install machinery and equipment in the building for the manufacture of electric washing machines, etc.

Beatty Bros., Fergus, Ont., manufacturers of barn equipment, hay forks, carriers, pumps, farm machinery, etc., are making arrangements for the establishing of a manufacturing plant at Regina, Sask., to cost \$60,000. The company is also extending its plant at Fergus, Ont., and is installing additional machinery.

The main workshop of the Maritime Bridge Co., New Glasgow, N. S., was destroyed by fire July 7. The company will rebuild immediately and will require machinery for the new plant.

It is now reported that the Commerce Truck Co. has decided to locate its Ontario plant at Kitchener, Ont., as a result of recent developments in connection with the industry. Negotiations were originally opened with Guelph, Ont., and announcements were made that the plant would be erected in that city.

The amalgamation of the Mann Axe & Tool Co., Ltd., St. Stephen, N. B., with the James Smart Mfg. Co., Ltd., Brockville, Ont., is announced. The Mann Axe & Tool Co. had its origin in St. Stephen in 1911, in conjunction with the James H. Mann Co. of Lewiston, Pa. It succeeded the Maritime Edge Tool Co., which in turn had been established there in 1900. It is expected that the St. Stephen branch of the new company will be directed, as in the past, by Charles E. Huestis, who will continue as president and general manager of the new concern, under the charter of the Mann Axe Co., Ltd.

Contracts have been awarded and construction work will be started at once on the erection of a factory at Brantford, Ont., for the A. C. Spark Plug Co., to cost \$35,000.

Grinnell & Co., 2440 Dundas Street, West, Toronto, Ont., have awarded contracts in connection with the erection of a foundry building to cost \$285,000, and work will be started immediately. It is estimated that the building and equipment for the foundry will cost approximately \$500,000.

Contracts have been awarded in connection with the building of a factory and power house at Windsor, Ont., to cost \$250,000, for the Burroughs Adding Machine Co., Plquette Avenue, Detroit, Mich.

Liverpool, N. S., is having plans prepared for the erection of a power plant to cost \$30,000. Smart & Burnett, 10 Cathcart Street, Montreal, Que., are engineers.

Fairgrieve & Son, 50 Davenport Road, Toronto, Ont., are in the market for a double crank, single action press, weight from 5 to 10 tons.

The Coleman Lamp Co., Wichita, Kan., is building a factory at Queen Street East and the Don Roadway, Toronto, Ont., for the manufacture of portable lamps.

Current Metal Prices

On Small Lots, from Merchants' Stocks, New York City

The quotations given below are for small lots, as sold from stores in New York City by merchants carrying stocks.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipment in carload lots from mills, these prices are given for their convenience.

Iron and Soft Steel Bars and Shapes

| Bars: | Per Lb. |
|--------------------------------|---------|
| Refined iron, base price | 5.25c. |
| Swedish bars, base price | 20.00c. |

Soft Steel:

| | |
|--|------------------|
| $\frac{3}{4}$ to $1\frac{1}{8}$ in., round and square..... | 3.52c. to 5.25c. |
| 1 to 6 in. x $\frac{3}{8}$ to 1 in..... | 3.52c. to 5.25c. |
| 1 to 6 in. x $\frac{1}{4}$ to $\frac{5}{16}$ | 3.62c. to 5.25c. |
| Rods— $\frac{5}{8}$ and $1\frac{1}{16}$ | 3.57c. to 5.05c. |
| Bands— $1\frac{1}{2}$ to 6 by $\frac{3}{16}$ to No. 8..... | 4.22c. to 6.50c. |
| Hoops | 5.57c. to 6.57c. |

Shapes:

| | |
|------------------------------------|------------------|
| Beams and channels—3 to 15 in..... | 3.47c. to 5.25c. |
|------------------------------------|------------------|

Angles:

| | |
|--|------------------|
| 3 in. x $\frac{1}{4}$ in. and larger..... | 3.47c. to 5.25c. |
| 3 in. x $\frac{3}{16}$ in. and $\frac{1}{8}$ in..... | 3.72c. to 5.60c. |
| $1\frac{1}{2}$ to $2\frac{1}{2}$ in. x $\frac{1}{8}$ in..... | 3.52c. to 5.90c. |
| $1\frac{1}{2}$ to $2\frac{1}{2}$ in. x $\frac{3}{16}$ in. and thicker..... | 3.47c. to 5.85c. |
| 1 to $1\frac{1}{4}$ in. x $\frac{3}{16}$ in. | 3.52c. to 5.90c. |
| 1 to $1\frac{1}{4}$ x $\frac{1}{8}$ in..... | 3.57c. to 5.95c. |
| $\frac{7}{8}$ x $\frac{7}{8}$ x $\frac{1}{8}$ in..... | 3.62c. to 6.00c. |
| $\frac{3}{4}$ x $\frac{1}{2}$ in..... | 3.67c. to 6.05c. |
| $\frac{5}{8}$ x $\frac{1}{2}$ in..... | 4.07c. to 6.85c. |
| $\frac{1}{2}$ x $\frac{3}{32}$ in..... | 5.17c. to 7.55c. |

Tees:

| | |
|--|------------------|
| 1 x $\frac{1}{8}$ in..... | 3.87c. to 6.25c. |
| $1\frac{1}{4}$ in. x $1\frac{1}{4}$ x $\frac{3}{16}$ in..... | 3.77c. to 6.15c. |
| $1\frac{1}{2}$ to $2\frac{1}{2}$ x $\frac{3}{16}$ in. and thicker..... | 3.57c. to 5.95c. |
| 3 in. and larger | 3.52c. to 5.30c. |

Merchant Steel

Per Lb.

| | |
|--|--------------------|
| Tire, $1\frac{1}{2}$ x $\frac{1}{2}$ in. and larger..... | 5.00c. to 5.25c. |
| (Smooth finish, 1 to $2\frac{1}{2}$ x $\frac{1}{4}$ in. and larger)..... | 5.50c. |
| Toe calk, $\frac{1}{2}$ x $\frac{3}{8}$ in. and larger..... | 6.00c. |
| Cold-rolled strip (soft and quarter hard)..... | 12c. to 14c. |
| Open-hearth spring steel | 7.00c. to 10.00c. |
| Shafting and Screw Stock: | |
| Rounds | 6.25c. to 7.00c. |
| Squares, flats and hex..... | 6.75c. to 7.50c. |
| Standard cast steel, base price..... | 15.00c. |
| Best cast steel | 20.00c. to 24.00c. |
| Extra best cast steel | 25.00c. to 30.00c. |

Tank Plates—Steel

Per Lb.

| | |
|-------------------------------------|------------------|
| $\frac{1}{4}$ in. and heavier | 3.67c. to 5.50c. |
|-------------------------------------|------------------|

Sheets

Blue Annealed

Per Lb.

| | |
|--------------|------------------|
| No. 10 | 7.12c. to 8.30c. |
| No. 12 | 7.15c. to 8.35c. |
| No. 14 | 7.22c. to 8.40c. |
| No. 16 | 7.32c. to 8.50c. |

Box Annealed—Black

| | Soft Steel C.R., One Pass Per Lb. | Wood's Refined, Per Lb. |
|-----------------------------------|---|-------------------------------|
| Nos. 18 to 20..... | 8.30c. to 9.90c. | |
| Nos. 22 and 24..... | 8.35c. to 9.85c. | 10.80c. |
| No. 26 | 8.40c. to 9.90c. | 10.85c. |
| No. 28 | 8.50c. to 10.00c. | 11.00c. |
| No. 30 | 8.60c. to 10.10c. | |
| No. 28, 36 in. wide, 10c. higher. | | |

Galvanized

Per Lb.

| | |
|-----------------------------------|--------------------|
| No. 14 | 8.75c. to 10.50c. |
| No. 16 | 9.00c. to 10.75c. |
| Nos. 18 and 20 | 9.15c. to 10.90c. |
| Nos. 22 and 24 | 9.30c. to 11.05c. |
| No. 26 | 9.45c. to 11.20c. |
| No. 27 | 9.60c. to 11.35c. |
| No. 28 | 9.75c. to 11.50c. |
| No. 30 | 10.25c. to 12.00c. |
| No. 28, 36 in. wide, 20c. higher. | |

Pipe

Standard—Steel

Wrought Iron

| | Blk. | Galv. | | Blk. | Galv. |
|------------------------------------|------|-------|--|------|-------|
| $\frac{1}{2}$ in. Butt... —36 —19 | | | $\frac{3}{4}$ -1 $\frac{1}{2}$ in. Butt. — 5 | +15 | |
| $\frac{3}{4}$ -3 in. Butt. —40 —24 | | | 2 in. Lap.... + 1 | +19 | |
| $3\frac{1}{2}$ -6 in. Lap. —35 —20 | | | $2\frac{1}{2}$ -6 in. Lap. — 1 | +15 | |
| 7-12 in. Lap.. —25 — 8 | | | 7-12 in. Lap.. +10 | +28 | |

On a number of articles the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general headings of "Iron and Steel Markets" and "Metal Markets."

Steel Wire

BASE PRICE* ON NO. 9 GAGE AND COARSER

Per Lb.

| | |
|----------------------------|---------|
| Bright basic | 8.00c. |
| Annealed soft | 8.00c. |
| Galvanized annealed | 8.50c. |
| Coppered basic | 8.50c. |
| Tinned soft Bessemer | 10.00c. |

*Regular extras for lighter gages.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

| | |
|------------------------|--|
| High brass sheet | 28 $\frac{1}{4}$ c. to 29 $\frac{1}{2}$ c. |
| High brass wire | 28 $\frac{1}{4}$ c. to 29 $\frac{1}{2}$ c. |
| Brass rod | 26 $\frac{1}{4}$ c. to 29 c. |
| Brass Tube | 43 $\frac{1}{2}$ c. to 45 $\frac{1}{2}$ c. |

Copper Sheets

Sheet copper, hot rolled, 24 oz., 29 $\frac{1}{2}$ c. per lb. base.
Cold rolled, 14 oz. and heavier, 2c. per lb. advance over hot rolled.

Tin Plates

Bright Tin

Coke—14x20

| Grade | Grade | Primes | Wasters |
|----------------|----------|-----------------|---------|
| "AAA" | "A" | 80 lb... 11.80 | 11.55 |
| Charcoal | Charcoal | 90 lb... 11.90 | 11.65 |
| 14x20 | 14x20 | 100 lb... 12.00 | 11.75 |
| IC... \$16.50 | \$14.25 | IC... 12.25 | 12.00 |
| IX... 18.75 | 16.25 | IX... 13.25 | 13.00 |
| IXX... 20.50 | 18.00 | IXX... 14.25 | 14.00 |
| IXXX... 22.25 | 19.75 | IXXX... 15.25 | 15.00 |
| IXXXX... 23.75 | 21.50 | IXXXX... 16.25 | 16.00 |

Terne Plates

8-lb. Coating 14 x 20

| | |
|-----------------------|--------|
| 100 lb. | \$9.35 |
| IC | 9.50 |
| IX | 10.50 |
| Fire door stock | 12.75 |

Tin

| | |
|-------------------|--------------|
| Straits pig | 54c. |
| Bar | 58c. to 60c. |

Copper

| | |
|--------------------|---------------------|
| Lake ingot | 20c. |
| Electrolytic | 19 $\frac{1}{2}$ c. |
| Casting | 19 $\frac{1}{4}$ c. |

Spelter and Sheet Zinc

| | |
|------------------------------------|-------------------------------|
| Western spelter | 10c. to 11c. |
| Sheet zinc, No. 9 base, casks..... | 14 $\frac{1}{2}$ c. open 15c. |

Lead and Solder*

| | |
|--|-----------------------------|
| American pig lead | 10c. to 10 $\frac{1}{2}$ c. |
| Bar lead | 11c. to 12c. |
| Solder $\frac{1}{2}$ and $\frac{1}{2}$ guaranteed..... | 38c. |
| No. 1 solder | 35c. |
| Refined solder | 31c. |

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

| | |
|-------------------------------|------|
| Best grade, per lb..... | 90c. |
| Commercial grade, per lb..... | 50c. |

Antimony

| | |
|---------------|-----------|
| Asiatic | 9 to 10c. |
|---------------|-----------|

Aluminum

| | |
|--|--------------|
| No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb.... | 35c. to 38c. |
|--|--------------|

Old Metals

Inquiry has been better though actual business was not heavy. Holders of material are generally firm in their ideas of values. Dealers' buying prices are as follows:

| | |
|--|-------|
| Copper, heavy and crucible | 16.00 |
| Copper, heavy and wire | 15.00 |
| Copper, light and bottoms | 13.00 |
| Brass, heavy | 10.25 |
| Brass, light | 7.50 |
| Heavy machine composition | 15.50 |
| No. 1 yellow brass turnings | 9.50 |
| No. 1 red brass or composition turnings..... | 12.25 |
| Lead, heavy | 7.00 |
| Lead, tea | 5.00 |
| Zinc | 5.25 |

